



October 4, 1996

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Commanding Officer
Southern Division
Naval Facilities Engineering Command
Mr. Nick Ugolini, Code 1843
2155 Eagle Drive
N. Charleston, SC 29406

Subject:

Contamination Assessment Report (CAR) for Building 109

Main Base

NTC, Orlando, Florida

CTO #107, Contract No. N62467-89-D-0317

Dear Mr. Ugolini:

Enclosed is the Contamination Assessment Report (CAR) for Building 109, Main Base, NTC Orlando, Florida. This CAR is submitted as Addendum 5 of the Main Base Master CAR.

Figure 1-2 and the table of contents for the Main Base Master CAR have been updated to include the CAR for Building 109. Please replace the table of contents (page IV) and Figure 1-2 (page 1-3) in the Main Base Master CAR with the ones provided.

If you have any questions or need additional information please contact the undersigned at 407/895-8845.

Very truly yours,

ABB ENVIRONMENTAL SERVICES, INC.

John P. Kaiser

Installation Manager

Manuel Alonso P.G. Senior Geologist

JPK/lak Enclosure

cc:

Wayne Hansel, Code 18B7, Southern Division

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Lt. Gary Whipple, NTC, Orlando

John Mitchell, FDEP File Copy (2 enc)

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ABB Environmental Services Inc.

CONTAMINATION ASSESSMENT REPORT

BUILDING 109 MAIN BASE

NAVAL TRAINING CENTER ORLANDO FLORIDA

Unit Identification Code: N65928

Contract No.: N62467-89-D-0317/107

Prepared by:

ABB Environmental Services, Inc. 2590 Executive Center Circle, East Tallahassee, Florida 32301

Prepared for:

Department of the Navy, Southern Division Naval Facilities Engineering Command 2155 Eagle Drive North Charleston, South Carolina 29418

Nick Ugolini, Code 1843, Engineer-in-Charge

October 1996



CERTIFICATION OF TECHNICAL DATA CONFORMITY (MAY 1987)

The Contractor, ABB Environmental Services, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/107 are complete and accurate and comply with all requirements of this contract.

DATE:	 October	30,	1996	

NAME AND TITLE OF CERTIFYING OFFICIAL: John Kaiser

Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL: Manuel Alonso, P.G. Project Technical Lead

(DFAR 252.227-7036)



FOREWORD

To meet its mission objectives, the U.S. Navy performs a variety of operations, some requiring the use, handling, storage, or disposal of hazardous materials. Through accidental spills and leaks and conventional methods of past disposal, hazardous materials may have entered the environment in ways unacceptable by today's standards. With growing knowledge of the long-term effects of hazardous materials on the environment, the Department of Defense initiated various programs to investigate and remediate conditions related to suspected past releases of hazardous materials at their facilities.

One of these programs is the Comprehensive Long-Term Environmental Action, Navy Underground Storage Tank (UST) program. This program complies with Subtitle I of the Resource Conservation and Recovery Act and the Hazardous and Solid Waste Amendments of 1984. In addition, the UST program complies with all State and local storage tank regulations as they pertain to the locations of each naval facility.

The UST program includes the following activities:

- registration and management of Navy and Marine Corps storage tank systems,
- contamination assessment planning,
- site field investigations,
- preparation of contamination assessment reports,
- remedial (corrective) action planning,
- · implementation of the remedial action plans, and
- petroleum storage system closures.

The Southern Division, Naval Facilities Engineering Command manages the UST program, and the Florida Department of Environmental Protection oversees the Navy UST program at the Naval Training Center (NTC) in Orlando, Florida.

In addition to the UST program, NTC, Orlando in conjunction with the Department of the Navy has instituted several programs to address the requirements of Base Realignment and Closure (BRAC). BRAC cleanup teams composed of representatives from the Navy, as well as Federal and State regulatory agencies, have been formed to address the multitude of issues surrounding base closure and to enhance environmental decision making at BRAC installations where property will be available for transfer to the community. This team approach is intended to foster partnering, accelerate the environmental cleanup process, and expedite timely, cost-effective, and environmentally responsible disposal and reuse decisions.

At NTC, Orlando, the BRAC process includes the evaluation of the environmental condition of the property to ensure the suitability of transfer, reuse, or lease.

Questions regarding the UST program at NTC, Orlando should be addressed to Mr. Nick Ugolini, Code 1843, at (803) 820-5596.

EXECUTIVE SUMMARY

ABB Environmental Services, Inc. (ABB-ES), has been authorized by Southern Division, Naval Facilities Engineering Command to prepare contamination assessment reports (CARs) for petroleum-impacted sites discovered during the Base Realignment and Closure Tank Management Plan implementation at the Naval Training Center, Orlando Main Base property in Orlando, Florida. This CAR has been prepared to evaluate soil and groundwater conditions at the Auto Service Center, Building 109.

This contamination assessment has been conducted following the guidelines contained in Section 62-770.600, Florida Administrative Code (FAC). A brief summary of the assessment results is provided below:

- 1. On November 1, 1993, Virogroup, Inc., collected groundwater samples from the previously existing compliance wells at Building 109 for analysis by U.S. Environmental Protection Agency Method 5030/8021 for volatile organic aromatics (VOAs). The laboratory analytical reports of these samples revealed the presence of benzene and total VOA constituents in excess of the State of Florida target cleanup levels.
- 2. In January 1994, three 20,000-gallon underground storage tanks (USTs) storing gasoline were removed by Environmental Recovery, Inc., at Building 109. During the UST removal activities, free product was observed, collected, and removed from the site by means of a dewatering operation. In addition, 1,115 cubic yards of excessively contaminated soil were removed and transported to a thermal treatment facility.
- 3. One additional 200-gallon UST used to store used oil is located immediately east of Building 109. The UST is scheduled for removal in 1997. A tank closure assessment report for the used oil UST will be prepared and submitted to FDEP.
- 4. Contamination assessment activities were conducted by ABB-ES from November 7, 1995, to September 19, 1996. Hand auger borings were advanced throughout the study area to assess if excessively contaminated soil was present and to evaluate the extent of soil contamination. No contaminated soil was encountered.
- 5. One temporary well (TW-1) was installed on November 7, 1995, to a depth of 8 feet below land surface (bls) to assess if petroleum impact to the shallow aquifer was present at the site. The temporary well was sampled and analyzed for the gasoline analytical group. No dissolved petroleum hydrocarbon contamination was detected. A letter report dated December 28, 1995, summarizing the soil and groundwater assessment findings was submitted to Florida Department of Environmental Protection (FDEP) for review.
- 6. Based on the results of the December 28, 1995, assessment report, the FDEP recommended (on January 19, 1996) that two shallow wells be installed and sampled to complete the CAR. On July 11, 1996, two shallow groundwater monitoring wells (MW-1 and MW-2) were installed to

- assess the horizontal extent of petroleum contamination in the shallow aquifer near the tank farm. The shallow monitoring wells were installed to a depth of 15 feet bls.
- 7. No dissolved petroleum hydrocarbon contamination exceeding Chapter 62-770, FAC, target cleanup levels was detected in groundwater samples from any of the monitoring wells.
- 8. One additional temporary well (TW-2) was installed to a depth of 8 feet bls to better assess the direction of shallow groundwater flow at the site. Groundwater flow direction was determined to be from southwest to northeast with a hydraulic gradient of 2.7 X 10⁻³ feet per foot. Due to the absence of petroleum impact to groundwater, no deep well was installed and no aquifer characterization was performed.
- 9. Based on the shallow groundwater flow direction, temporary well TW-2 was found to be downgradient of the UST area; therefore, TW-2 was sampled on September 3, 1996, for the gasoline analytical group. No dissolved petroleum hydrocarbon contamination was detected in groundwater samples from temporary well TW-2.
- 10. No active potable water wells are located within 0.25 mile of this site.
- 11. ABB-ES recommends a No Further Action proposal for this site.

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GLOSSARY

ABB Environmental Services, Inc. ABB-ES below land surface bls CA contamination assessment CAR Contamination Assessment Report Florida Administrative Code FAC **FDEP** Florida Department of Environmental Protection ID inside diameter Naval Training Center NTC organic vapor analyzer OVA TOC top of casing U. S. Environmental Protection Agency USEPA UST underground storage tank

1.0 SITE DESCRIPTION AND BACKGROUND INFORMATION

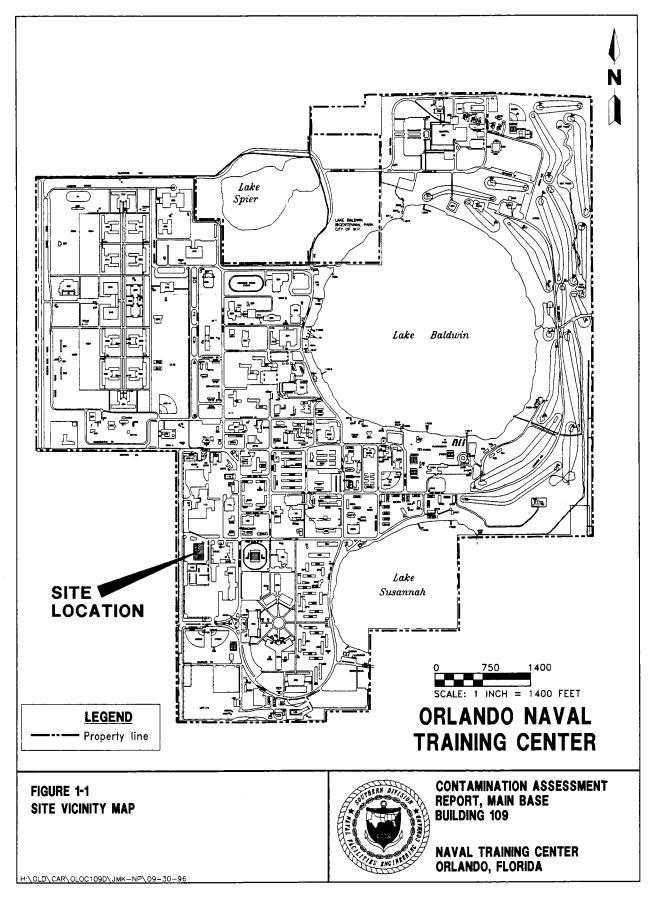
Building 109 (Auto Service Center) is located in the southwest part of the Naval Training Center (NTC), Main Base, in Orange County, Florida. The site lies within the northeast quarter of Section 20, Township 22 South and Range 30 East, as shown on the Orlando East, Florida, U.S. Geological Survey Quadrangle Map. Figure 1-1 shows the site location and a map of the surrounding area. The site is located at the intersection of Bennett Road and Langley Avenue within the Main Base property.

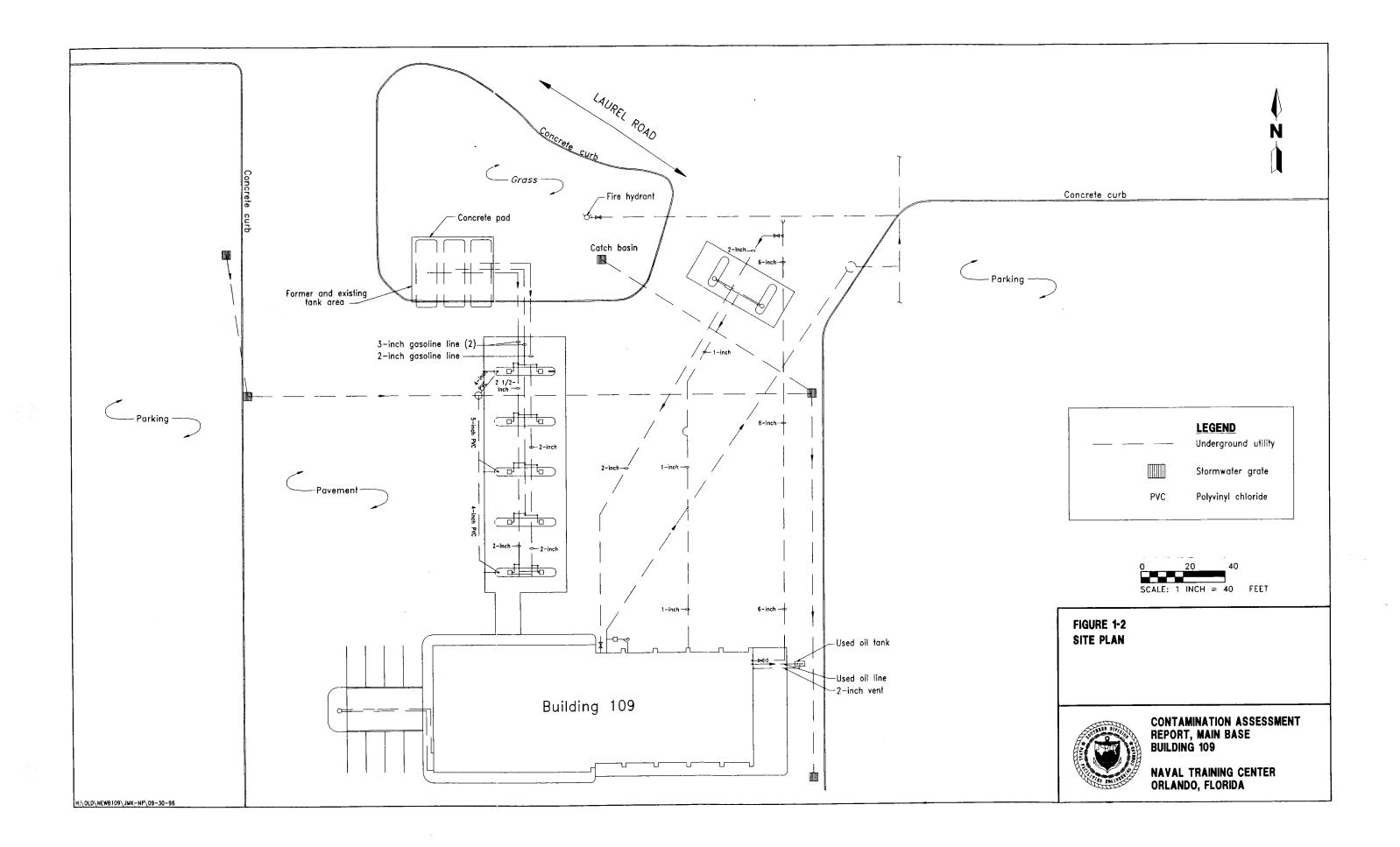
Building 109 is a one-story building constructed of concrete block with a flat tar and gravel roof. It is currently used as a gasoline and auto repair station and has offices, a retail store, and a storage room. Aerial photos indicate that, prior to building construction in 1974, the property was undeveloped. Photographs of the site showing existing physical features are included in Appendix A, Site Photographs.

Three 20,000-gallon underground storage tanks (USTs) of steel construction were operated at the site since 1974 and were replaced in January 1994, by Environmental Recovery, Inc. During the removal activities, free product was observed, collected, and removed from the excavation. In addition, 1,115 cubic yards of excessively contaminated soil were removed and transported to a thermal treatment facility. Subsequent to the tank removals and soil excavation, the UST area was dewatered and a concrete secondary containment structure installed. Three new, fiberglass 20,000-gallon USTs were placed within the former tank area. The location of the petroleum storage system is shown on Figure 1-2, Site Plan. During the tank removal and replacement, approximately 58,500 gallons of extracted groundwater were removed and transported to a treatment facility. Also, approximately 68,400 gallons of extracted water were discharged to the City of Orlando sanitary sewer system. A copy of the tank closure assessment report and initial remedial action report is included in Appendix B, Tank Closure Assessment Report and Initial Remedial Action report.

One 200-gallon UST used to store used oil from service bays is located immediately east of Building 109. The used oil UST is scheduled to be removed in 1997. A tank closure assessment report will be completed upon removal of the UST.

On November 7, 1995, ABB Environmental Services, Inc. (ABB-ES), completed hand auger borings throughout the study area to assess the presence of petroleum impact to soil and to evaluate the extent of soil contamination. No soil contamination was encountered. One temporary monitoring (TW-1) was installed west of the UST area and sampled for gasoline analytical group. No dissolved petroleum hydrocarbon contamination was detected. A letter report dated December 28, 1995, summarizing the assessment findings was submitted to Florida Department of Environmental Protection (FDEP) for review. On January 19, 1996, the FDEP requested that two permanent shallow monitoring wells be installed and sampled. Appendix C contains the letter report and the FDEP letter dated January 19, 1996. One additional temporary well (TW-2) was installed north of the UST area and sampled for the gasoline analytical group.





This contamination assessment report (CAR) summarizes the data gathered during the contamination assessment (CA) activities at Building 109. General information such as regional physiography, geology, hydrogeology, investigative methodologies, and procedures are included in the NTC, Orlando Main Base CAR (ABB-ES, March 1996).

2.0 CONTAMINATION ASSESSMENT METHODOLOGY

2.1 SOIL BORING PROGRAM. In order to determine if petroleum contaminated-soil exists onsite, 9 hand auger borings were advanced using a 3.25-inch inside diameter (ID) stainless steel bucket auger on November 7, 1995. Figure 2-1 shows the locations of the hand auger borings. The borings were completed into the water table, which was encountered at approximately 7 feet below land surface (bls).

Twenty-seven soil samples were collected from the 9 hand auger borings. The soil samples were collected at 1 to 3 feet, 3 to 5 feet, and 5 to 7 feet bls. Headspace organic vapor concentrations were measured for all soil samples by placing the soil sample in a 16-ounce glass jar and using a calibrated organic vapor analyzer (OVA), Foxboro 128 equipped with a flame ionization detector following procedures outlined in Chapter 62-770, Florida Administrative Code (FAC). Carbon filters are utilized to differentiate total hydrocarbon response from naturally occurring methane gas. Filtered and unfiltered readings are obtained from a single jar. All sampling and analysis is performed in accordance with ABB-ES's FDEP-approved Comprehensive Quality Assurance Plan.

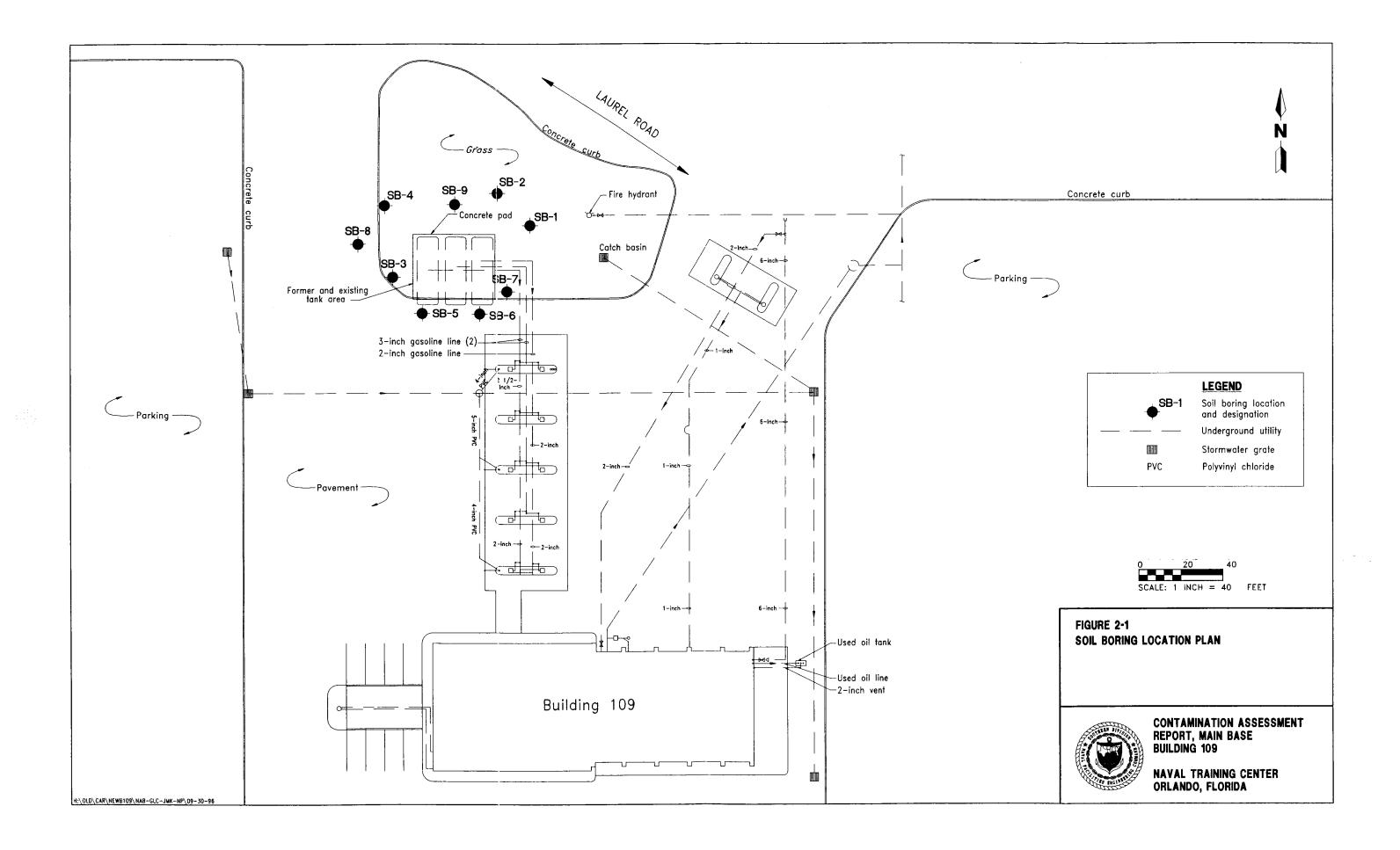
2.2 MONITORING WELL INSTALLATION PROGRAM. Two shallow monitoring wells (MW-1 and MW-2) were installed at the site on July 11, 1996. The wells were installed using hollow-stem auger techniques to a depth of approximately 15 feet bls. A typical shallow monitoring well construction detail is provided as Figure 2-2. Each well was constructed with 10 feet of 2-inch-diameter 0.010-inch slotted well screen coupled to 5 feet of 2-inch-diameter schedule 40 solid polyvinyl chloride. This assembly is placed in the borehole so that the screen interval is located at a depth that encompasses seasonal water table fluctuations. The annular space between the screen and the borehole is filled with 20/30-grade silica sand to 1 foot above the screened interval. A 1-foot fine sand (30/65-grade) seal is placed on top of the filter pack. The remaining annular space is sealed to grade with neat cement grout mixture. A summary of the well construction details is presented in Table 2-1, and Appendix D, Well Construction Details, contains the well completion logs provided by the drilling subcontractor.

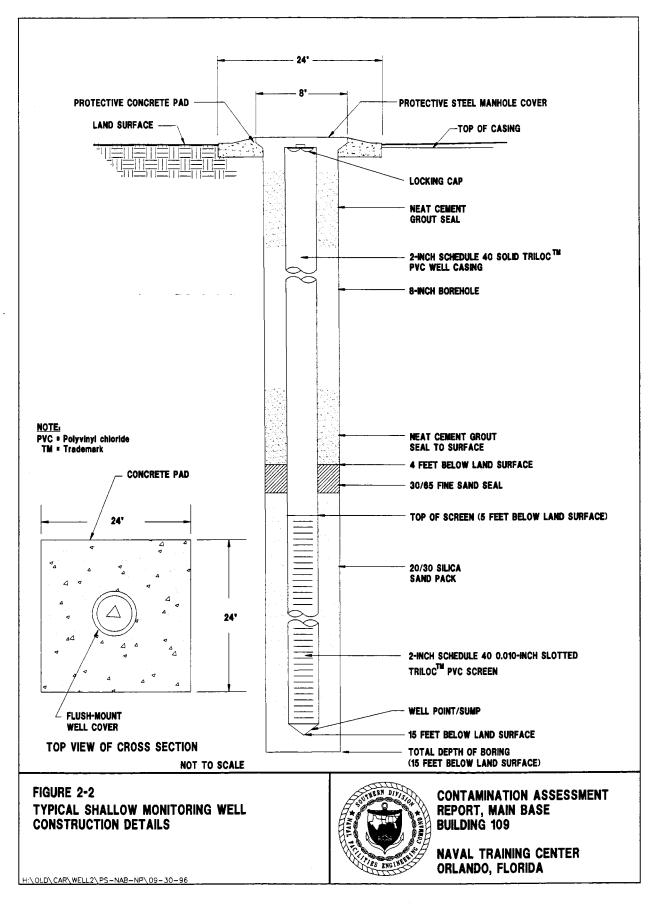
Table 2-1 Groundwater Monitoring Well Construction Data Summary

Contamination Assessment Report Building 109, Main Base Naval Training Center Orlando, Florida

Well Number	Date Installed	Total Depth (feet bls)	Well Diameter (inches)	Screened Interval (feet bis)	Slot Size (inches)	Comments
MW-1	07/11/96	15	2	5-15	0.01	Installed by Groundwater Protection, Inc.
MW-2	07/11/96	15	2	5-15	0.01	Installed by Groundwater Protection, Inc.

Note: bls = below land surface.





All monitoring wells are completed flush-mount with surface grade well vaults, and locking well caps are installed to conform with standards outlined in 40C-3, FAC. Each monitoring well is developed by overpumping until clear and free of sediment. Thorough field decontamination procedures are strictly enforced to prevent possible cross-contamination between field monitoring points. All drilling equipment, including drilling rods, bits, and hollow-stem augers, is thoroughly decontaminated between each well installation.

- 2.3 GROUNDWATER SAMPLING PROGRAM. Groundwater samples were collected from temporary monitoring well TW-1 on November 8, 1995, and monitoring wells MW-1 and MW-2 on July 18, 1996. All samples were packed on ice and transported to Quality Analytical Laboratories, Inc., for analysis. The groundwater samples were analyzed for the sampling requirements established in Chapter 62-770, FAC, for sites with gasoline discharges; these requirements are defined under the gasoline analytical group, which includes the following U.S. Environmental Protection Agency (USEPA) methods: 504 (ethylene dibromide), 601 (volatile halocarbons), 602 (volatile organic aromatics), and 239.2 (total lead).
- 2.4 GROUNDWATER ELEVATION SURVEY. The elevation and slope of the water table was calculated using the field-surveyed top-of-well casing data for each monitoring well, and correlating the elevation data to a common datum. On August 2, August 16, and September 19, 1996, depth to groundwater was measured from the top of casing (TOC) to the nearest hundredth of a foot in each of the monitoring wells with an electronic water-level indicator. The groundwater depths were subtracted from the TOC elevation to obtain relative water table elevations. The wells were checked for the presence of free product by visual inspection of groundwater samples taken from each well and by the use of an oil-water interface probe.

3.0 GEOLOGY AND HYDROGEOLOGY

- 3.1 SITE STRATIGRAPHY. For purposes of this investigation, site stratigraphy and aquifer evaluation were limited to the surficial aquifer beneath the site. The soil profile for the Building 109 site is based on visual examination of soil samples collected from soil borings and drill cuttings obtained during the investigation. A typical stratigraphic soil profile consists of sand and gravel fill to 5 feet bls and brown, fine sand down to a depth of 15 bls. Lithologic logs for soil borings and monitoring wells installed during this investigation are included as Appendix C, Lithologic Logs.
- 3.2 SITE HYDROGEOLOGY AND GROUNDWATER FLOW DIRECTION. Groundwater elevations across the site were calculated by measuring water levels on August 2, August 16, and September 19, 1996, in the site's monitoring wells and by surveying the relative top-of-casing elevations. The hydraulic gradient across the site was calculated by measuring the change in elevation head between monitoring well MW-1 and temporary well TW-2 and dividing this head difference by the horizontal distance between these two wells. The scaled horizontal distance is 70 feet, and the change in elevation head between the wells, as measured on August 16, 1996, was 0.19 foot. The calculated hydraulic gradient is equal to 2.7 X 10⁻³ feet per foot. The site groundwater flow direction, based on the water table surface map, is from southwest to northeast. Table 3-1 is a summary of groundwater elevation data for the August 2, August 16, and September 19, 1996, sampling events. Figures 3-1, 3-2, and 3-3 are the water table contour maps for August 2, August 16, and September 19, 1996, respectively.
- $\underline{3.3}$ AQUIFER CHARACTERISTICS. Due to lack of groundwater contamination, no slug tests were performed at this site.
- 3.4 POTABLE WELL SURVEY. A potable well survey for the surrounding area is included in the Main Base CAR. No active potable wells are reported in the site vicinity. One potable well (WW-9), currently not in service, is located approximately 0.6 mile from the site. Several irrigation wells are located in the vicinity of the site, including WW-4, 800 feet north; WW-5, 1,200 feet northeast; and WW-6, 1,400 feet southeast. See Figure 5-1, potable and irrigation well locations, of the Main Base CAR.
- 3.5 SURFACE WATER. The surface water body nearest to the site is Lake Susannah, which is approximately 1,500 feet east of the site. In addition, several other lakes, including Lake Shannon (1,600 feet), Lake Gear (1,750 feet), and Lake Baldwin (2,200 feet), are located in the site vicinity.

Table 3-1 Groundwater Elevation Summary

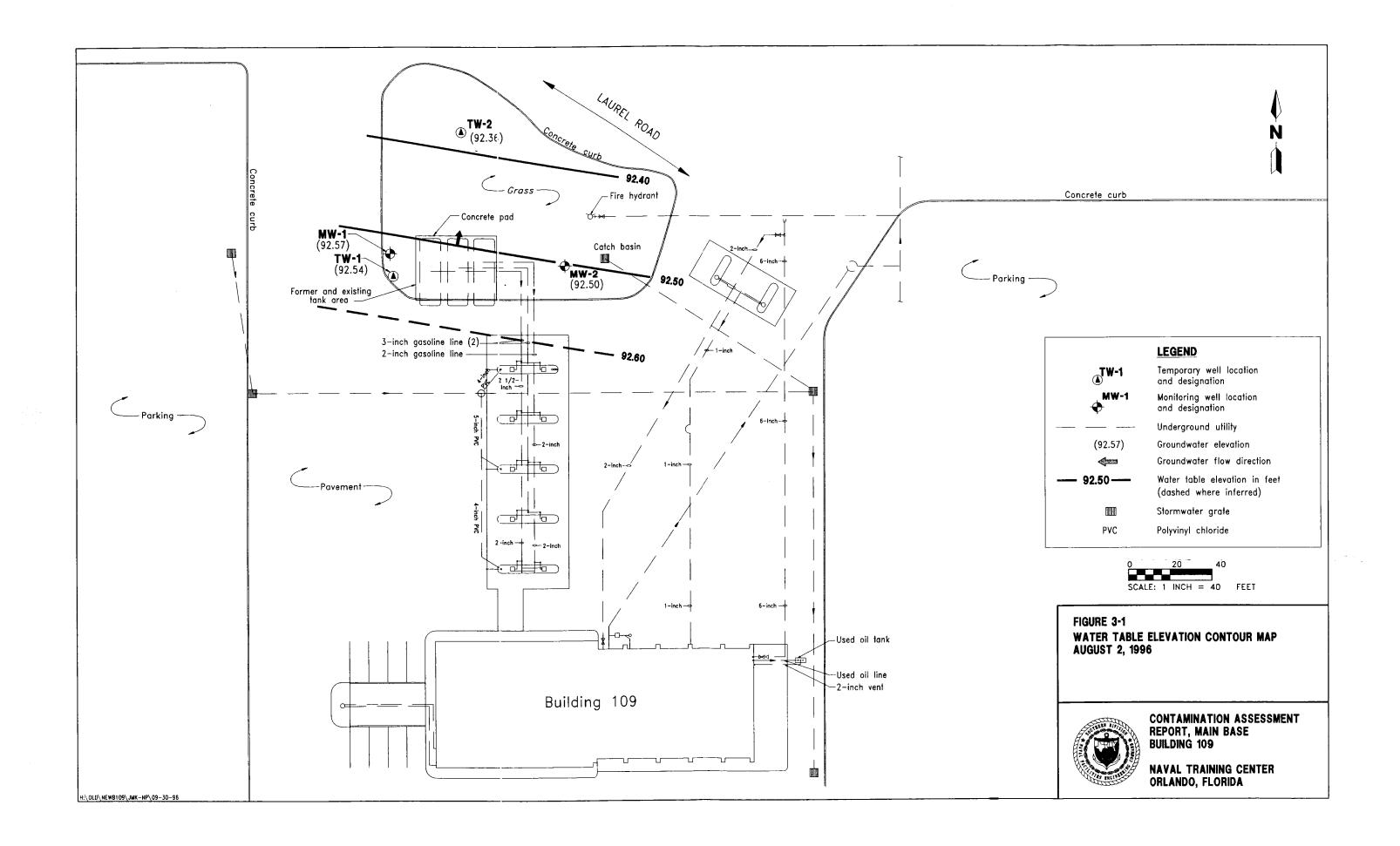
Contamination Assessment Report Building 109, Main Base Naval Training Center Orlando, Florida

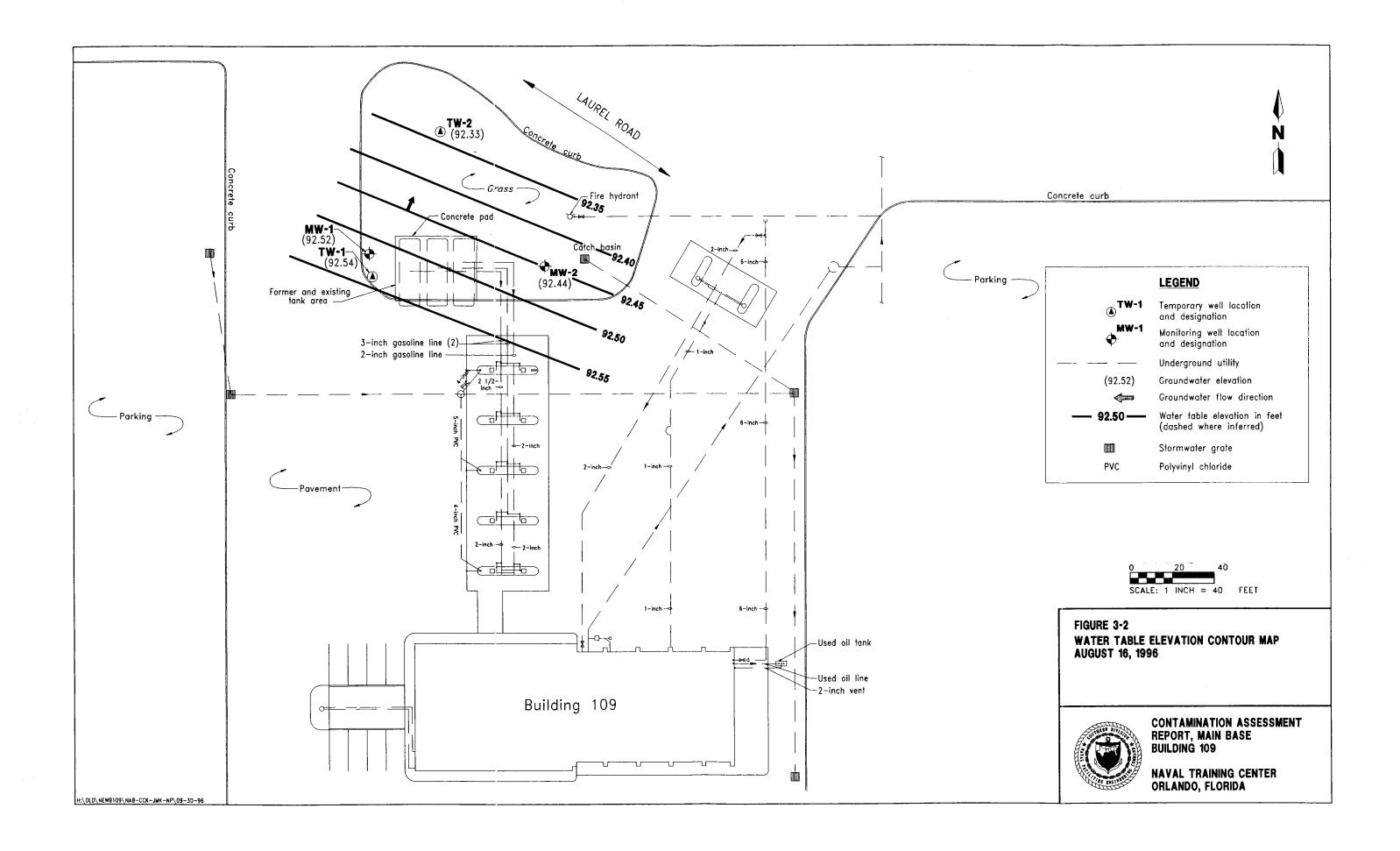
Well Number	Date	Depth to Product (ft btoc)	Depth to Water (ft btoc)	Product Thickness (feet)	Top-of-Casing Elevation ¹ (feet)	Water-Level Elevation ¹ (feet)			
MW-1	08/02/96		7.43	_	100.00	92.57			
	08/16/96	_	7.48	-		92.52			
	9/19/96		7.23			92.77			
MW-2	08/02/96		7.10	-	99.60	92.50			
	08/16/96		7.16	-		92.44			
	9/19/96	-	6.94	-		92.66			
TW-1	08/02/96	_	9.19	-	101.73	92.54			
	08/16/96		9.23	-		92.50			
	9/19/96	-	8.98			92.75			
TW-2	08/02/96	_	8.53		100.89	92.36			
	08/16/96	-	8.56			92.33			
	9/19/96		8.33			92.56			

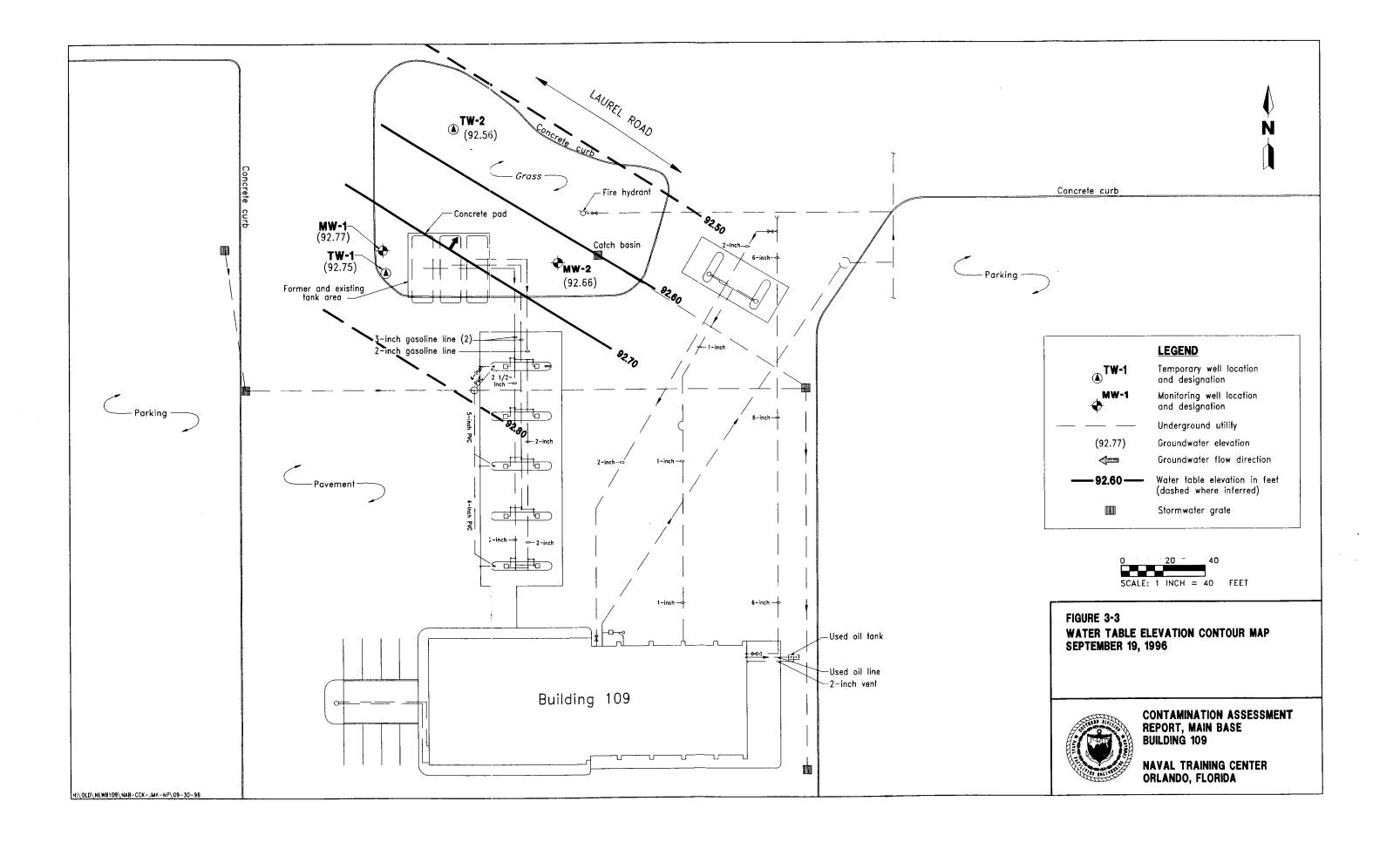
¹ Referenced to arbitrary datum.

Notes: ft btoc = feet below top of casing.

- = not applicable.







4.0 CONTAMINATION ASSESSMENT RESULTS

4.1 SOIL CONTAMINATION. Nine hand auger soil borings (SB-1 through SB-9) were advanced using a 3.25-inch-ID stainless steel hand-operated bucket auger on November 7, 1995. Figure 2-1 shows the hand auger boring locations. Twenty-seven soil samples were collected at discrete intervals for OVA analysis. A summary of OVA results is presented in Table 4-1.

No petroleum-impacted soil was encountered during the CA activities.

- 4.2 FREE-PRODUCT OCCURRENCE. No free product was detected during the CA activities.
- 4.3 GROUNDWATER CONTAMINATION. Two shallow monitoring wells (MW-1 and MW-2) were installed at the site on July 11, 1996, and sampled on July 18, 1996. These wells were installed to assess the groundwater flow direction and the horizontal extent of hydrocarbon contamination. In addition, one temporary well (TW-2) was installed on August 2, 1996, and sampled on September 3, 1996. The temporary well was installed to assess the groundwater flow direction. Locations of all wells are shown on Figure 4-1.

Groundwater samples were collected from monitoring wells MW-1 and MW-2 on July 18, 1996, and from temporary well TW-2 on September 3, 1996. Groundwater samples were analyzed for the gasoline analytical group, which includes USEPA Method 601 (volatile organic halocarbons), USEPA Method 602 (volatile organic aromatics plus methyl tert-butyl ether), USEPA Method 504 (ethylene dibromide), and USEPA 239.2 (total lead). Laboratory analytical results indicate that dissolved petroleum contamination above Chapter 62-770, FAC, target cleanup levels was not detected in any of the wells sampled. The laboratory analytical reports are included in Appendix F, and the results are summarized in Table 4-2.

Table 4-1 Summary of Organic Vapor Analyses, November 1995

Contamination Assessment Report Building 109, Main Base Naval Training Center Orlando, Florida

Soil Boring Designation	Sample Depth (feet bis)	Unfiltered (ppm)	Filtered (ppm)	Total Hydrocarbons (ppm)	Physical Observations
SB-1	1-3	<1	<1	<1	No staining, no petroleum odor.
	3-5	<1	<1	<1	No staining, no petroleum odor.
	5-7*	<1	<1	<1	No staining, no petroleum odor.
SB-2	1-3	<1	<1	<1	No staining, no petroleum odor.
	3-5	<1	<1	<1	No staining, no petroleum odor.
	5-7	<1	<1	<1	No staining, no petroleum odor.
SB-3	1-3	<1	<1	<1	No staining, no petroleum odor.
	3-5	<1	<1	<1	No staining, no petroleum odor.
	5-7	<1	<1	<1	No staining, no petroleum odor.
SB-4	1-3	<1	<1	<1	No staining, no petroleum odor.
	3-5	<1	<1	<1	No staining, no petroleum odor.
	5-7	1	<1	1	No staining, no petroleum odor.
SB-5	1-3	<1	<1	<1	No staining, no petroleum odor.
	3-5	<1	<1	<1	No staining, no petroleum odor.
	5-7	<1	<1	<1	No staining, no petroleum odor.
SB-6	1-3	<1	<1	<1	No staining, no petroleum odor.
	3-5	<1	<1	<1	No staining, no petroleum odor.
	5-7	<1	< 1	<1	No staining, no petroleum odor.
SB-7	1-3	<1	<1	<1	No staining, no petroleum odor.
	3-5	<1	<1	<1	No staining, no petroleum odor.
	5-7	<1	<1	<1	No staining, no petroleum odor.
SB-8	1-3	<1	< 1	<1	No staining, no petroleum odor.
	3-5	<1	<1	<1	No staining, no petroleum odor.
	5-7	<1	<1	<1	No staining, no petroleum odor.
SB-9	1-3	<1	<1	<1	No staining, no petroleum odor.
	3-5	<1	< 1	<1	No staining, no petroleum odor.
	5-7	<1	<1	<1	No staining, no petroleum odor.

^{*} Water table encountered at approximately 7 feet bls.

Notes: bls = below land surface.

ppm = parts per million.

<1 = nondetectable limit for organic vapor analyzer.

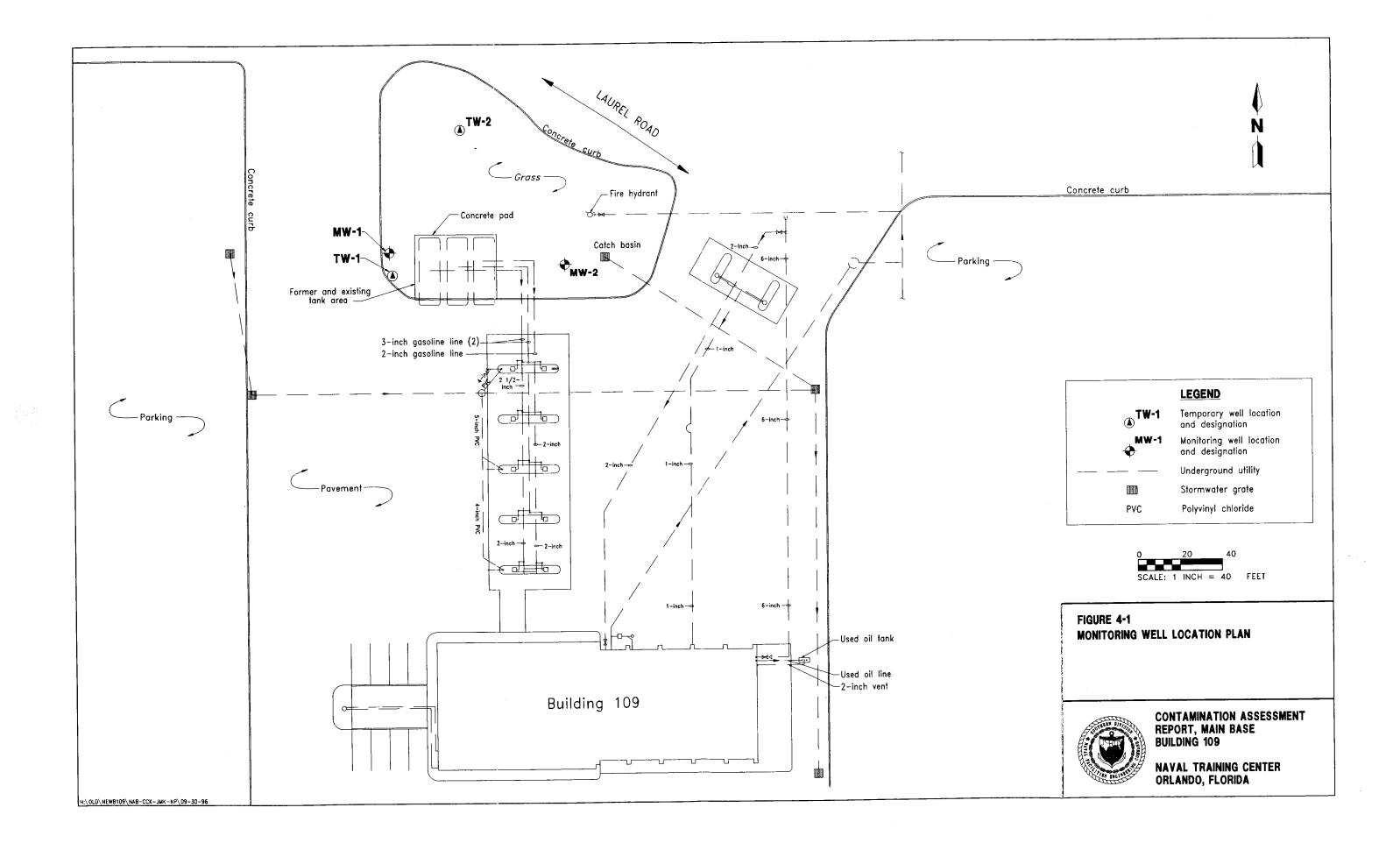


Table 4-2 Summary of Groundwater Analytical Results

Contamination Assessment Report Building 109, Main Base Naval Training Center Orlando, Florida

	Charter CO 770	Monitoring Well Number							
Parameter	Chapter 62-770 - Target Cleanup Levels	TW-1 11/8/95	MW-1 07/18/96	MW-2 07/18/96	TW-2 9/3/96	Rinsate Blank 07/18/96			
Benzene	1	< 1.0	< 1.0	<1.0	< 1.0	< 1.0			
Toluene	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Ethylbenzene	NA	< 1.0	< 1.0	<1.0	< 1.0	< 1.0			
Xylenes	NA	< 1.0	< 3.0	<3.0	<3.0	<3.0			
Total VOA	50	<1.0	<1.0	<1.0	< 1.0	<1.0			
MTBE	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
EDB	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02			
Total Lead	50	4.5	14.0	23.4	<3.0	<3.0			

All results in micrograms per liter, unless noted. Bold text indicates total VOA concentrations.

Notes: < = less than.

NA = not applicable.

VOA = volatile organic compounds. MTBE = methyl tert-butyl ether. EDB = ethylene dibromide.

5.0 SOURCE OF HYDROCARBONS

- $\underline{5.1}$ HYDROCARBON TYPE. The hydrocarbon types stored in the USTs at Building 109 are unleaded regular, mid-grade, and premium gasoline.
- $\underline{\text{5.2}}$ SOURCE OF HYDROCARBON PLUME. No dissolved petroleum contamination was detected at Building 109 during this assessment.
- <u>5.3 MECHANISM OF TRANSPORT</u>. None of the drainage ditches or utility lines near the study area appears to influence groundwater flow in the surficial aquifer. The lack of petroleum contamination in groundwater does not give any insight into the possible mechanisms of transport.

6.0 RECOMMENDATIONS

Based on the results of this investigation, ABB-ES recommends a No Further Action proposal for this site.

NTC_B109.CAR PMW.09.96

7.0 PROFESSIONAL REVIEW CERTIFICATION

This document, Contamination Assessment Report, Building 109, Main Base, Naval Training Center, Orlando, Florida, has been prepared under the direction of a Professional Geologist registered in the state of Florida. The work and professional opinions rendered in this report were conducted or developed in accordance with commonly accepted procedures consistent with applicable standards of practice. This assessment is based on the geologic investigation and associated information detailed in the text and appended to this report or referenced in public literature. Recommendations are based upon interpretations of the applicable regulatory requirements, guidelines, and relevant issues discussed with regulatory personnel during the site investigation. If conditions that differ from those described are determined to exist, the undersigned geologist should be notified to evaluate the effects of any additional information on this assessment or the recommendations made in this report. This report meets the criteria set forth in Chapter 492 of the Florida Statutes with regard to good professional practices as applied to Chapter 62-770, FAC. This CAR was developed for the Building 109 site at the Main Base, NTC, Orlando, in Orlando, Florida, and should not be construed to apply to any other site.

> Manuel Alonso Professional Geologist P.G. No. 0001256

> > 10/3/96

Date

NTC_B109.CAR PMW.09.96

REFERENCES

- ABB Environmental Services, Inc., 1996, Contamination Assessment Report, Main Base, Naval Training Center, Orlando, Florida, March.
- Driscoll, F.G., 1986, *Groundwater and Wells*, 2nd edition, St. Paul, Minnesota: Johnson Filtration Systems, Inc.
- Florida Department of Environmental Protection (FDEP), 1989, Guidelines for the Preparation of Contamination Assessment Reports for Petroleum Contaminated Sites, October.
- FDEP, 1994, Guidelines for Assessment and Remediation of Petroleum Contaminated Soil, May.
- Ground Water Guidance Concentrations, 1994, Florida Department of Environmental Protection, June.

APPENDIX A SITE PHOTOGRAPHS



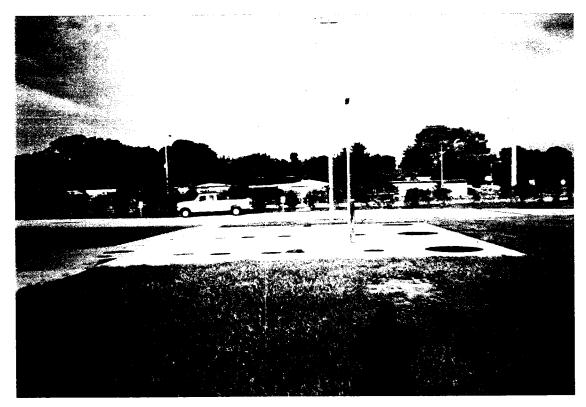
Photograph 1:

View of UST area at Building 109 facing north.



Photograph 2:

View of UST area at Building 109 facing south. island canopy and Building 109 in background.



Photograph 3:

Facing west, UST area at Building 109.



Photograph 4:

Facing east, UST area at Building 109.

APPENDIX B

INITIAL SITE ASSESSMENT REPORT AND FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION REVIEW LETTER (JANUARY 19, 1996)

December 28, 1995 Doc. No.: 08518-359

Florida Department of Environmental Protection ATTN: Mr. John Mitchell 2600 Blair Stone Road Tallahassee, Florida 32399-2400

Subject:

Navy Exchange, Building 109

Petroleum Contamination Assessment

Dear John:

ABB-ES was tasked by the Navy on April 24, 1995 to develop a Plan of Action (POA) that would address suspected petroleum contamination at the subject site. This site is the Navy Exchange Service Station which sells gasoline to NTC Orlando patrons. During a 1993 excavation and removal action of the three 20,000 gallon tanks, free product was observed, collected, and removed from the site. The closure report is included as Attachment A. Three 20,000 gallon fiberglass tanks were then installed.

In the intervening months, and during the BRAC Tank Management Plan (TMP) work scope, documentation has been found and interviews have been conducted which suggested that a significant amount of contaminated soil was removed in addition to the free product. As part of our TMP work, Southern Division requested that ABB-ES screen the soil and groundwater immediately around the old excavation during the tanks removal action, to substantiate the presence or absence of contamination. Results of those analytic samples are included as Attachment B. OVA screening results are shown in Table 1. It appears, from these results, that there is no soil or groundwater contamination in the area sampled. Attachment B shows the locations of those borings.

Based on these findings, ABB-ES requests that the subject site be reviewed and suggests, based on current test results, removal from the Site Management Plan (SMP). Should you have any questions concerning this letter or the site results, please call Nick Ugolini at (803)820-0596 or me at (407)895-8845.

Very Truly Yours,

ABB Environmental Services, Inc.

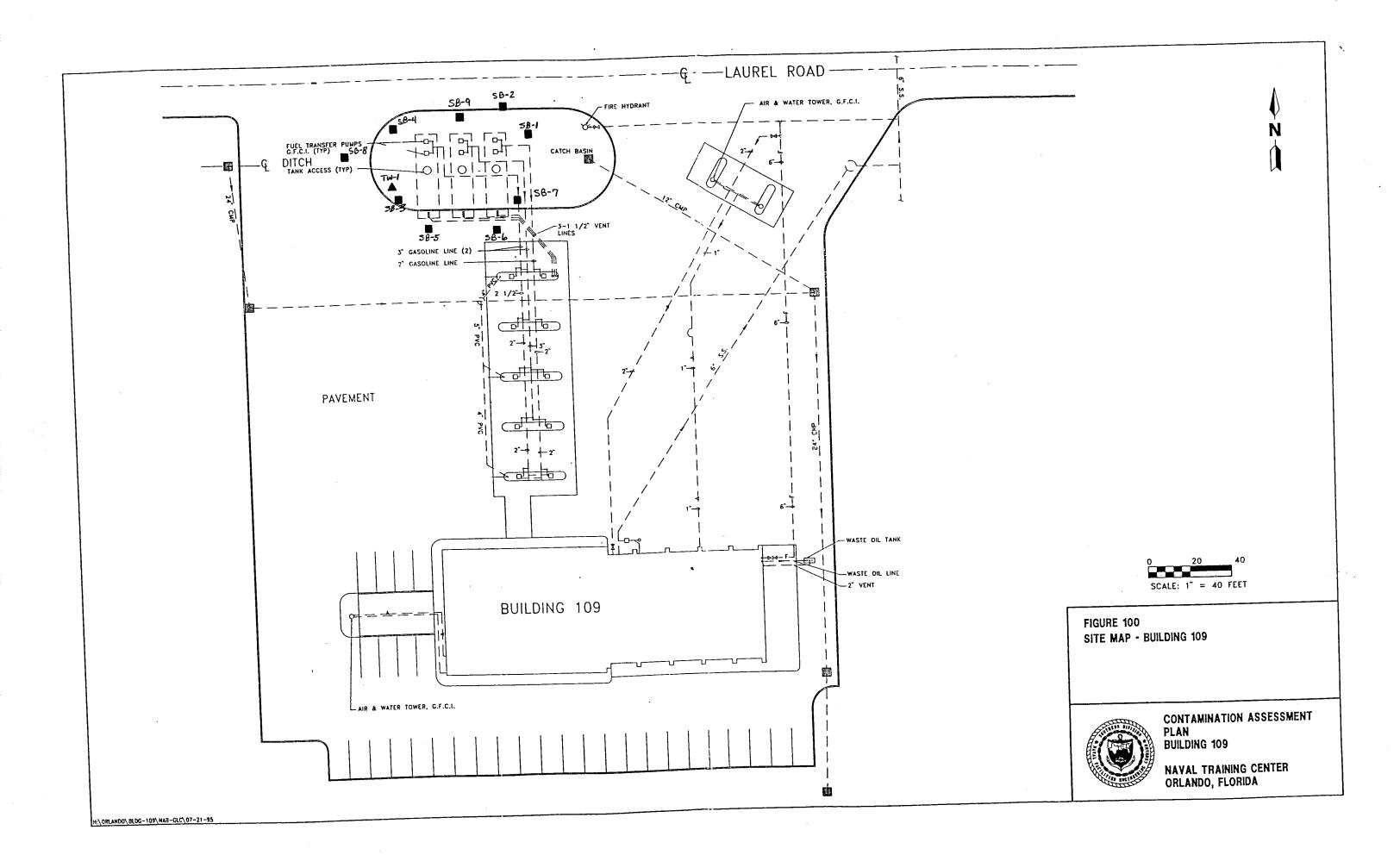
John P. Kaiser Installation Manager

JPK/mjp

cc:

N. Ugolini, Southern Division E. Nuzie, FDEP M. Alonso, ABB-ES

a:\ust\mitchl12.22



OVA SOIL HEADSPACE RESULTS* NTC ORLANDO, BUILDING 109 (November 7, 1995)

Sampling Interval				Soil	Boring Nur	nber		_	
(feet bls)	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8	SB-9
1 - 3	0	0	0	0	0	8	0	0	0
3 - 5	0	0	0	0	0	0	0	0	0
5 - 7**	0	0	0	1	0	0	0	0	0

Key:

bls = Below land surface.

OVA = Organic vapor analyzer.

^{*} All results in parts per million (PPM) corrected for methane.

^{**} Water table present at approximately 7.0 feet bls.

ATTACHMENT A

CLOSURE ASSESSMENT REPORT ORLANDO NAVAL TRAINING CENTER - BUILDING 109 ORLANDO, ORANGE COUNTY, FLORIDA

Prepared for:

Environmental Recovery Inc. 251 Levy Road Atlantic Beach, Florida 32233

APR 2 6 1994

ROICC / ORLANDO

Prepared by:

ViroGroup, Inc., Missimer Division 118 West Orange Street Altamonte Springs, Florida 32714 April 18, 1994

Signature

Date

David R. Giddens, Jr., P.G.

Florida Licensed Professional Geologist #1654

1.0 INTRODUCTION

Environmental Recovery, Inc. (ERI) retained ViroGroup, Inc., Missimer Division (ViroGroup) to perform a closure assessment in conjunction with the removal of three (3) 20,000-gallon underground storage tanks (USTs) and the associated fuel distribution system located at the Orlando Naval Training Center (NTC). The project site is specifically located at the NTC building 109, in Orlando, Orange County, Florida.

The purpose of providing environmental services with the removal and dismantling of the USTs, is to document the subsurface conditions adjacent to and beneath the USTs and associated fuel distribution system, and to comply with the closure assessment requirements stipulated in Chapter 17-761 of the Florida Administrative Code (FAC) and the Florida Department of Environmental Protection's (FDEP's) "Pollutant Storage Tank Closure Assessment Requirements," dated April, 1992. Decontamination and sampling procedures were performed in general accordance with ViroGroup's approved Comprehensive Quality Assurance Plan (CQAP), which is on file with the FDEP. The appropriate state and local agencies were notified that initial activities associated with UST removal operations would commence on January 7, 1994. A completed Underground Storage Tank Installation and Removal Form for Certified Contractors, and a Closure Assessment Form, are presented in Appendix A, as Attachments 1 and 2, respectively.

2.0 UST REMOVAL

ERI was retained by the Orlando NTC as the pollutant storage systems specialty contractor for this project. On January 7, 1994, ERI initiated UST removal operations by evacuating the free-phase petroleum product from the three USTs and the associated fuel distribution system. On January 9, 1994, the USTs were tripple rinsed and the accumulated rinsate water was removed. The rinsate water was transported by ERG to the Industrial Water Services, Inc. (IWS) facility located in Jacksonville, Florida., for permanent disposal. Copies of the disposal manifests for the rinsate water are provided

in Appendix B, as Attachment 1. The USTs and associated fuel distribution system were inspected and certified as clean and inert by a certified industrial hygienist (CIH) on January 13, 1994. A copy of the CIH certification letter is provided in Appendix C.

ERI installed a cofferdam shoring system around the perimeter of the UST area to prevent caving of the excavation side walls during UST removal operations, and to provide a safe working environment during the installation of three new 20,000-gallon USTs. ERI also utilized basic dewatering techniques to depress the water table within the cofferdam structure during the UST removal/installation operations. Approximately 58,500 gallons of extracted groundwater was removed and transported by ERI and disposed of at IWS. Copies of the disposal manifests for the extracted groundwater are also included in Appendix B, as Attachment 2. Due to the costs associated with transportation and disposal of the extracted groundwater, ERI discharged approximately 68,400 gallons of extracted groundwater into the City of Orlando sanitary sewer system following issuance of a temporary discharge permit. Copies of the laboratory reports for the sanitary sewer pre-acceptance analysis are provided in Appendix D, as Attachment 1, and a copy of the temporary sanitary sewer discharge permit is provided as Appendix E. A copy of the sanitary sewer discharge manifest letter from ERI to the City of Orlando is presented in Appendix B, as Attachment 3.

Excavation of the overburden material from above the USTs was initiated on January 13, 1994. During removal of the USTs, "excessively contaminated" soils, as defined in Chapter 17-770.200(2), were encountered within the UST excavation pit. As a result of the detected "excessively contaminated" soils, ERI proceeded with initial remedial action (IRA) activities following the physical removal of the USTs. All UST removal and IRA activities were supervised by ViroGroup, and a site inspection was conducted by a representative from the Orange County Environmental Protection Department (OCEPD) during UST removal operations. The physical removal of the USTs and all excavation activities were concluded as of January 21, 1994.

3.0 CLOSURE ASSESSMENT

On November 1, 1993, ViroGroup collected groundwater samples from the four preexisting compliance monitor wells (MW-1 through MW-4) for analysis by EPA Method 5030/8021 for volatile organic aromatics (VOAs). The groundwater samples were immediately packed on ice and delivered on the same date, following standard chain-ofcustody protocol, to V.O.C. Analytical Laboratories, Inc. The laboratory analysis revealed the presence of benzene in the groundwater samples collected from MW-1, MW-3, and MW-4 at concentrations of 81.0 micrograms per liter (ug/l), 458 ug/l, and 1,000 ug/l, respectively. Total VOA constituents were detected in the groundwater samples collected from MW-1, MW-3, and MW-4 at concentrations of 467 ug/l, 6,003 ug/l, and 21,400 ug/l, respectively. Methyl-tert butyl ether was also detected in the groundwater samples collected from MW-1, MW-3 and MW-4, at concentrations of 710 ug/l, 1,180, and 530 ug/l, respectively. No VOA constituents were identified above the laboratory detection limits in the groundwater sample collected from MW-2. The monitor well locations are illustrated on Figure 1, Appendix F. The results of the groundwater analysis have been summarized in Table 1, Appendix G. Copies of the analytical reports are presented in Appendix D, as Attachment 2. As a result of the detected groundwater contamination, a discharge reporting form (DRF) was submitted to the OCEPD on January 20, 1994. A copy of the DRF is included in Appendix A, as Attachment 3.

Pursuant to standard protocol, soil samples were collected at five-foot intervals within the UST excavation pit, when accessible, and at twenty-foot intervals along the piping trenches during the UST removal operations. These soil samples were field screened for total hydrocarbon vapor and methane vapor content by headspace analysis utilizing a Heath Consultants organic vapor analyzer (OVA) equipped with a flame ionization detector. Results of the soil screening indicated that vapor-phase petroleum contamination was present in the soils along the vent line connections within the tank hole excavation from approximately one foot below land surface (BLS) to the top of the USTs (approximately five feet BLS). ViroGroup also identified the presence of vapor-phase petroleum contamination in the soil across the extent of the excavation pit from

pproximately five feet BLS to approximately fifteen feet BLS. No vapor-phase petroleum contaminated soils were identified within the product line trench or beneath the dispenser islands. The approximate locations of the soil sample collection points are illustrated on Figure 2, Appendix F. The results of the headspace analyses are presented in Table 2, Appendix G. Approximately 1,115.29 cubic yards of vapor-phase petroleum contaminated soil was excavated by ERI and thermally treated at the Soil Treatment Services, Inc. facility located in Kissimmee, FL. A copy of the completed IRA summary form is provided in Appendix A, as Attachment 5, and copies of the soil disposal manifests are included in Appendix B, as Attachment 4. Copies of laboratory reports for the the pre-burn samples are included in Appendix D, as Attachment 3.

In conclusion, soil and groundwater samples collected within the immediate vicinity of the UST excavation did contain petroleum-based contaminant concentrations in excess of the state target clean-up levels. Therefore, additional assessment activities and subsequent soil and groundwater remediation will be required pursuant to the criteria established in Chapter 17-770, F.A.C.

Florida Department of Environmental Regulation

Twin Towers Office Bidg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

EA Form # _	17-761.900(5)
Un m Tee Re	derground Storage Tank Installation & movel Form for Certified Contractors
ecave Date.	December 10, 1990
R Applicat	on No.
	(F4ed in by DER)

Underground Storage Tank Installation and Removal Form For Certified Contractors

Pollutant Storage System Specialty Contractors as defined in Section 489.113, Florida Statutes (Certified contractors as defined in Section 17-761.200, Florida Administrative Code) shall use this form to certify that the installation, replacement or removal of the storage tank system(s) located at the address listed below was performed in accordance with Department Reference Standards.

at the address listed below was performed in accordance with Department Reference Standards.	
General Facility Information	
1. DER Facility Identification No.: 2. Facility Name: Naval Training Center Bld. #109 Telephone: 407 646-5345 Control Address (obscious): NTC Bld. # 109	
Orlando, Florida	
4. Owner Name: U.S. Navy Telephone: (407) 646-5345	
5. Owner Address: ROICC Orlando, P.O. Drawer 149089, Orlando, FE 32014 3007 6. Number of Tanks: a. Installed at this time 3 b. Removed at this time 3	
7. Tank(s) Manufactured by: Owens - Corning 8. Date Work Initiated: 01/07/94 9. Date Work Completed: 01/28/94	
Underground Pollutant Tank Installation Checklist Please certify the completion of the following installation requirements by placing an (X) in the appropriate box.	
1. The tanks and piping are corrosion resistant and approved for use by State and Federal Laws.	X
(American Petroleum Institute) 1615, PEI (Petroleum Equipment Institute) 11 100 07 and the manufacturers' 3. Tanks and piping pretested and installed in accordance with NFPA 30(87), API 1615, PEI/RP100(87) and the manufacturers' specifications.	×
 Steel tanks and piping are cathodically protected in accordance with NFPA 30(87), API 1632, UL (Underwriters Laboratory) 1746, STI (Steel Tank Institute) R892-89 and the manufacturer's specifications. 	×
 Tanks and piping tested for tightness after installation in accordance with NFPA 30(87) and PEI/RP100-87. Monitoring well(s) or other leak detection devices installed and tested in accordance with Section 17-761.640, Florida 	×
Administrative Code (F.A.C.) 7. Spill and overfill protection devices installed in accordance with Section 17-761.500, F.A.C. 3. Secondary containment installed for tanks and piping as applicable in accordance with Section 17-761.500, F.A.C.	X
Please Note: The numbers following the abbreviations (e.g. API 1615) are publication or specification numbers issued by these instu	tutions
Underground Pollutant Tank Removal Checklist	x
 Closure assessment performed in accordance with Section 17-761.800, F.A.C. Underground tank removed and disposed of as specified in API 1604 in acordance with Section 17-761.800, F.A.C. 	×



Florida Department of Environmental Regulation Twin Towers Office Bidg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

DER Form # 17-761.900(6)	
Form Title Closure Assessment Form	_
Effective Date December 10, 1990	_
Laga A Luisa NA	
(Filled in by DER)	_

Closure Assessment Form

Owners of storage tank systems that are replacing, removing or closing in place storage tanks shall use this form to demonstrate that a storage system closure assessment was performed in accordance with Rule 17-761 or 17-762, Florida Administrative Code. Eligible Early Detection Incentive (EDI) and Reimbursement Program sites do not have to perform a closure assessment.

Please Print or Type Complete All Applicable Blanks

1 D:	ate:0	4/15/	94
3 D	EB Eacility	, ID Num	ber: 3. County: Orange
4 F	acility Nam	ne: Orl	ando Naval Training Center - Building 109
~ F.	11th - Ower	or: I	Department of Defense
		. 12.7	d #109 Orlando Naval Training Center, Orlando, Florida
7 A	Acilina Ada	drees. Ro	DICC Orlando - P.O. Drawer 149087, Orlando, FL 32814-9087
7. IV	lailing Auc	Number	(407) 646-5345 9. Facility Operator: U.S. Navy
10 A	re the Sto	rage Tar	k(s): (Circle one or both) A. Aboveground or (B. Underground) Stored: Unleaded Gasoline
12. V	Vere the Ta	ank(s):	(Circle one) A. Replaced B. Removed C. Closed in Place D. Upgraded (aboveground tanks only) Unknown 14. Age of Tanks:
			Facility Assessment Information
Yes	No Ap	Not plicable	
	\boxtimes		1. Is the facility participating in the Florida Petroleum Liability Insurance and Restoration Program (FPLIRP)?
X			2. Was a Discharge Reporting Form submitted to the Department? If yes, When: 01/20/94 Where: Orlando - OCEPD
X			3. Is the depth to ground water less than 20 feet?
X			4. Are monitoring wells present around the storage system? If yes, specify type: X Water monitoring Vapor monitoring
	X		5. Is there free product present in the monitoring wells or within the excavation?
X			6. Were the petroleum hydrocarbon vapor levels in the soils greater than 500 parts per million for gasoline? Specify sample type: Vapor Monitoring wells X Soil sample(s)
		X	7. Were the petroleum hydrocarbon vapor levels in the soils greater than 50 parts per million for diesel/kerosene?
			Specify sample type: Vapor Monitoring wells Soil sample(s)
X			8. Were the analytical laboratory results of the ground water sample(s) greater than the allowable state target levels (See target levels on reverse side of this form and supply laboratory data sheets)
_		X	9. If a used oil storage system, did a visual inspection detect any discolored soil indicating a release?
	X		10. Are any potable wells located within 1/4 of a mile radius of the facility?
Ш			11. Is there a surface water body within 1/4 mile radius of the site? If yes, indicate distance:

0	DER Form a 17-761,900(5) Underground Storage Tank Installation & Form Tile Removal Form for Certified Contractors
	Effective Date December 10, 1990
1	DER Application No(Filled in by DER)

Certification

hereby certify and attest that I am familiar with the facility that is registered with the Florida Department of Environmental Regulation; that to the est of my knowledge and belief, the tank installation, replacement or removal at this facility was conducted in accordance with Chapter 489 and ection 376303, Florida Statutes and Chapter 17-761, Florida Administrative Code (and its adopted reference sources from publications and standards the National Fire Protection Association (NFPA), the American Petroleum Institute (API), the National Association of Corrosion Engineers (NACE), merican Society for Testing and Materials (ASTM); Petroleum Equipment Institute (PEI); Steel Tank Institute (STI); Underwriters Laboratory (UL); and the tank and integral piping manufacturers' specifications; and that the operations on the checklist were performed accordingly.

RUSSELL B. GORDON (Type or Print)	PSSSC Number
Certified Pollutant Tank Contractor Name Pollutant Storage System Specialty Contractor License Number (PSSSC)	
Russell Mordon	U-20-94 Date
Certified Tank Contractor Signature	Date
David R. Giddens Jr., P.G. (Type or Print)	04/15/94 Date
(Type or Print) Field Supervisor Name	
Field Supervisor Signature	04/15/94 Date

The owner or operator of the facility must register the tanks with the Department at least 10 days before the installation. The installer must submit this form no more than 30 days after the completion of installation to the Department of Environmental Regulation at the address printed at the **top** of page one.



Florida Department of Environmental Regulation

Twin Towers Office Bidg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

DER Form #1	7-781.900(1)	
Form Tale Disc	harge Reporting Form	
Ellective Date_D	ecember 10, 1990	
DER Appreciation		
	(Fåed in by DER)	

Discharge Reporting Form

Use this form to notify the Department of Environmental Regulation of:

- 1. Results of tank tightness testing that exceed allowable tolerances within ten days of receipt of test result.
- 2. Petroleum discharges exceeding 25 gallons on pervious surfaces as described in Section 17-761.460 F.A.C. within one working day of discovery.
- 3. Hazardous substance (CERCLA regulated), discharges exceeding applicable reportable quantities established in 17-761.460(2) F.A.C., within one working day of the discovery.
- 4. Within one working day of discovery of suspected releases confirmed by: (a) released regulated substances or pollutants discovered in the surrounding area. (b) unusual and unexplained storage system operating conditions, (c) monitoring results from a leak detection method or from a tank closure assessment that indicate a release may have occurred, or (d) manual tank gauging results for tanks of 550 gallons or less, exceeding ten gallons per weekly test or five gallons averaged over four consecutive weekly tests.

Mail to the DER District Office in your area listed on the reverse side of this form

PLEASE PRINT OR TYPE

	Complete all applicable blanks
1.	DER Facility ID Number: 2. Tank Number: 2. Tank Number: 3. Date: 2.
4.	Facility Name: Naval Training Center, Building 109
	Facility Owner or Operator: Naval Training Center
	Facility Address: Bennett Road, Orlando, FL 32814
	Mailing Address: P.O. Drawer 149087, Orlando, FL 32814-9047
5.	Date of receipt of test results or discovery:
6.	Method of initial discovery. (circle one only) A. Liquid detector (automatic or manual) B. Vapor detector (automatic or manual) C. Tightness test (underground tanks only). D. Emptying and Inspection. E. Inventory control. F. Vapor or visible signs of a discharge in the vicinity. G. Closure: G.V. SAmples prior to remove (explain) H. Other:
7.	Estimated number of gallons discharged: Unknown
8.	What part of storage system has leaked? (circle all that apply) A. Dispenser B. Pipe C. Fitting D. Tank (E.)Unknown
;	Type of regulated substance discharged. (circle one) A. leaded gasoline D. vehicular diesel L. used/waste oil B. unleaded gasoline F. aviation gas M. diesel C. gasohol G. jet fuel O. new/lube oil V. hazardous substance includes pesticides, ammonia, chlorine and derivatives (write in name or Chemical Abstract Service CAS number) Z. other (write in name)
10.	Cause of leak. (circle all that apply) A. Unknown C. Loose connection E. Puncture G. Spill I. Other (specify) B. Split D. Corrosion F. Installation failure H. Overfill
] 11.]	Type of financial responsibility. (circle one) A. Third party insurance provided by the state insurance contractor B. Self-insurance pursuant to Chapter 17-769.500 F.A.C. C. Not applicable D. None
	o the best of my knowledge and belief all information submitted on this form is true, accurate, and complete.
7	Printed Name of Owner, Operator or Authorized Representative Signature of Owner, Operator or Authorized Representative

	-7 -7- 000(E)
	17-761 900(6)
Form Title C	losure Assessment Form
	December 10, 1990
Ellective Date	December 10
DER Applical	on No(Filed in by DER)
	(Filled in by DER)

12. A detailed drawing or sketch of the facility that includes the storage system location, monitoring wells, buildings, storm drains, sample locations, and dispenser locations must accompany this form.

13. If a facility has a pollutant storage tank system that has both gasoline and kerosene/diesel stored on site, both EPA Method 602 and EPA Method 610 must be performed on the ground water samples obtained.

14. Amount of soils removed and receipt of proper disposal.

If yes is answered to any one of questions 5-9, a Discharge Reporting Form 17-761.900(1) indicating a suspected release shall be submitted to the Department within one working day.

16. A copy of this form and any attachments must be submitted to the Department's district office in your area and to the locally administered program office under contract with the Department within 60 days of completion of tank removal or filling a tanks with an inert material.

PASTRUK M. STENGER MANY CONSTRUCTION REPOSERED WIND gaature of Owner 04/15/94Perferming Assessment

Florida Licensed Professional Geologist #1654

Title of Person Performing Assessment

State Ground Water Target Levels That Affect A Pollutant Storage Tank System Closure Assessment

State ground water target levels are as follows:

1. For gasoline (EPA Method 602):

a. Benzene

1 ug/l

h. Total VOA

50 ug/l

- Benzene

- Toluene

- Total Xylenes

- Ethylbenzene

c. Methyl Test-Butyl

50 ug/l

Ether (MTBE)

2. For kerosene/diesel (EPA Method 610):

a. Polynuclear Aromatic

(Best achievable detection Hydrocarbons (PAHS) limit, 10 ug/l

maximum)

ROICC/ORLANDO

PETROLEUM CONTAMINATION INITIAL REMEDIAL ACTION REPORT FORM

An Initial Remedial Action report, summarizing the initial remedial action (IRA), should be prepared to satisfy the requirements of Chapters 17-770.630(1)14; 17-773.500(1)(a)4; and 17-773.500(2)(a)4, Florida Administrative Code, (FAC). This form may be used for the IRA report. The report should be sent to the appropriate local program and:

Florida Department of Environmental Regulation Bureau of Waste Cleanup Engineering Support Section 2600 Blair Stone Road Tallahassee, FL 32399-2400

DER Facility Number (11 applicable). Date IRA Initiated: 1/7/94 Date IRA Completed: 1/21/94 FREE PRODUCT RECOVERY N/A
Type(s) of Product Discharged: N/A
1. Estimated Gallons Lost: N/A N/A (date) 2. Gallons Recovered: N/A through N/A (date) 3. Attach Exhibit Indicating Amount of Product Recovered Dates and Cumulative Totals.
Attach a Scaled Site Plan, Indicating the Locations an Product Thickness in Wells, Boreholes, Excavations, of Utility Conduits and Wells Utilized for Recovery of Fredrict.
Method of Product Recovery: N/A

F.	Type of Treatment, i.e., Oil/Water Separator:N/A
G.	Attach Written Proof of Proper Disposal of Recovered Product: $\frac{\mathrm{N/A}}{}$
III.	SOIL EXCAVATION
•	NOTE: Soil shall be defined as excessively contaminated stated in Chapter 17-770.200(2), FAC. using the procedure stated in Chapter 17-770.200(2), FAC. Representative soil sampling shall be performed as close to Representative soil sampling shall be performed as close to the time of excavation as possible, but at no time shall the time of excavation as possible, but at no time shall exceed three (3) months prior to the start of excavation. Exceeding the soils greater than thirty (30) days on site stockpiled greater than thirty (30) days on si
	IRA activities shall be performed except to IRA activities shall b
	excavation can be soil.
	unless the established weight per unit volume of 1.4 tons/cubic yard (as referenced in FAC Rule 17-775) is used for the excavated soil, the weight per unit volume must be determined by a field test (in which an accurately measured determined by a field test (in which are accurately measured volume of soil is weighed) at the time of excavation.
	coil Excavated in Cubic Yards:
λ.	Volume of Contaminated Soil Excavation (s): 1,1115.52 y ³ Dimensions Including Depth of Excavation(s): 48 feet long x 48 feet wide x 18 feet deep
no	Attach written proof from the Department in the form of an Alternate Procedure Approval Order authorizing excavating over 1500 cubic yards if applicable. Authorization must be prior to the excavation of soils.
B	Type(s) of Product in Soil: Gasoline Florida Department of Environmental Regulation MAY 1992
	,

Depth (ft) to Ambient Groundwater at the Time of C. 12 feet below land surface Excavation(s):____ Did Dewatering (i.e. groundwater depression) Occur at Time D. of Excavation?: Yes Type of Instrument and Method Used to Determine Excessive Soil Contamination: Health Consultant PORTA-FID II (OVA/FID) E. Attach a table that compares the OVA-FID readings taken with charcoal filter verses readings without filter. Include F. vertical depths for each sample. Included in closure report. defining excassively procedure for contaminated soil as referenced in Rule 17-770.200(2), FAC, include a scaled site plan with the information listed G. Included in closure report below: Location of excavation, old tank farm, dispensers, and product lines, present tank farm, and all soil samples. The corresponding OVA-FID readings for each soil sample (with charcoal filter and without) and its depth must be given. Sampling Procedure is as follows: 2. Start sampling in a location where it is suspected that excessively contaminated soil exists. Sample from the first soil boring outward in a grid pattern, at five (5) to ten (10) foot intervals, until the perimeter of the excessively contaminated soil plume is defined. should be performed starting approximately at the initial area of contamination and continued at three (3) foot intervals, or fraction thereof, until a depth approximately one (1) foot above the water table is reached. Copies of Laboratory Analyses for Pre Treatment Soil Samples as Required in Chapter 17-775.410(3), Table II, FAC Must be H. Included in closure report.

Were Tanks Replaced at this Site?: Yes-(3)20,000-gallon

double walled Owens-Corning fiberglass tanks

I.

Attached.



INVIRONMENTAL CONTROL SECTION /IRONMENTAL SERVICES DEPARTMENT

5100 L.B. McLEOD ROAD ORLANDO, FLORIDA 32811 TELEPHONE (407) 246-2664 FAX (407) 246-2886

February 10, 1994

Environmental Recovery, Inc. 251 Levy Road P. O. Box 330569 Atlantic Beach, FL 32233-0569

ATTN: Mr. Jay Daniel, Contracts Manager

DISCHARGE OF GROUNDWATER RE:

Dear Mr. Daniel:

Based upon the laboratory analysis presented and a site inspection, the City of Orlando's Environmental Control Section has approved E.R.I.'s request to discharge groundwater that was recovered from the dewatering operation at building 109 at the Naval Training Center.

The following stipulations shall apply:

Naval Training Center Requirements:

- Discharge to nearest manhole; 1.
- Prefer gravity discharge; 2.
- Discharge between hours of 6:00 p.m. to 6:00 a.m.; and 3.
- Discharge pressure (if pumped) should not exceed 20 psi. 4.

City of Orlando Requirements:

- A six digit totalizing water meter must be installed 1. to measure all flow being discharged to the sanitary sewer system;
- A discharge sample shall be collected near 2. completion of discharge to the sanitary sewer The sample shall be analyzed for constituents located within EPA methods 601, 602, 610, and 239.2;

February 10, 1994 Environmental Recovery, Inc. Page Two

- 3. Lower Explosion Limit (LEL) readings shall be collected at the point of discharge into the sanitary sewer system. These readings shall be taken at one hour intervals during discharge. Any LEL reading in excess of 5% on the meter shall require the following:
 - a. Discontinue discharge;
 - b. Immediate telephone notification to:

 Lt. Commander Ballinger at 646-5278 and
 City of Orlando Environmental Control Section
 at 246-2664.
- 4. Notify this office 24 hours prior to commencement of discharge.

If you have any questions, please call Shane Benner or me at 246-2664.

Sincerely, Burgess A. Johnson

Burgess A. Johnson Environmental Specialist

BAJ/syi

TABLE 1 GROUNDWATER ANALYTICAL RESULTS

Well Number	Date Sampled	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Total VOA	MTBE
	11/01/93	81.0	47.7	39.3	299	467	710
MW-1		BDL	BDL	BDL	BDL	BDL	BDL
MW-2	11/01/93			656	4,320	6,003	1,180
MW-3	11/01/93	458	569			21,400	530
MW-4	11/01/93	1,000	7,700	2,000	10,700	ļ	BDL
	11/01/93	BDL	1.2	BDL	BDL	BDL	BUL

NOTE: All parameters measured in units of micrograms per liter (ug/l).

BDL: Below Detection Limits

Total VOA: The summation of detected benzene, toluene, ethyl benzene and total xylenes concentrations.

MTBE: Methyl Tert-Butyl Ether

TABLE 2
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

SOIL SAMPLE IDENTIFICATION	DEPTH OF SAMPLE COLLECTION (IN FEET BLS)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)
		<1	NT	<1
A-1	1	5,000	800	4,200
A-1	5		6	2,494
A-1	10	2,500		>5,000
A-1	15	>5,000	<1	
	1	<1	NT	<1
B-1		<1	NT	<1
B-1	15	<1	NT	<1
C-1	1		<1	1,000
C-1	5	1,000		>5,000
C-1	10	>5,000	<1	
	1	<1	NT	<1
D-1		900	7	893
D-1 D-1	5	900	7	893

NOTE: An ambient air OVA-FID measurement of <1 parts per million was recorder on-site prior to initiation field screening.

PPM - Parts per million

BLS - Below land surface

TABLE 2 (CONTINUED)
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

SOIL SAMPLE IDENTIFICATION	DEPTH OF SAMPLE COLLECTION (IN FEET BLS)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)
	(IN FEET BLS)	>5000	<1	>5,000
D-1	10		<1	>5,000
D-1	15	>5,000		<1
	1	<1	NT	
E-1		<1	NT	<1
E-1	5		<1	>5,000
E-1	10	>5,000	NT	<1
F-1	1	<1	NI	
r- ı	5	45	6	39
F-1		>5,000	<1	>5,000
F-1	10		<1	250
G-1	1	250		1,000
	5	1,000	<1	
G-1		>5,000	<1	>5,000
G-1	10			

NOTE: An ambient air OVA-FID measurement of <1 parts per million was recorder on-site prior to initiation field screening.

PPM - Parts per million

BLS - Below land surface

TABLE 2 (CONTINUED)
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

SOIL SAMPLE IDENTIFICATION	DEPTH OF SAMPLE COLLECTION (IN FEET BLS)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)
	1	<1	NT	<1
H-1	5	1,500	<1	1,500
H-1	10	>5,000	<1	>5,000
H-1	1	<1	NT	<1
I-1	5	1,700	21	1,679
-1 		>5,000	<1	>5,000
I-1 .	10	<1	NT	<1
J-1	1		<1	2,000
J-1	5	2,000	90	4,910
J-1	10	5,000	<1	>5,000
J-1	15	>5,000		70
K-1	1	70	<1	

PPM - Parts per million

BLS - Below Land Surface

TABLE 2 (CONTINUED)
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

SOIL SAMPLE IDENTIFICATION	DEPTH OF SAMPLE COLLECTION (IN FEET BLS)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)
	5	>5,000	<1	>5,000
K-1		2,800	<1	2,800
K-1	10	45	<1	45
L-1	1		<1	1,400
L-1	5	1,400		4,000
L-1	10	4,000	<1	
A-2	1	<1	NT	<1
B-2	1	<1	NT	<1
	5	1,000	35	965
B-2	1	<1	NT	<1
C-2		<1	NT	<1
E-2	1		<1	>5,000
E-2	10	>5,000	<u> </u>	

PPM - Parts per million

BLS - Below Land Surface

TABLE 2 (CONTINUED)
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

SOIL SAMPLE IDENTIFICATION	DEPTH OF SAMPLE COLLECTION (IN FEET BLS)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)
E-2	15	60	<1	60
F-2	1	<1	NT	<1
	1	450	<1	450
G-2	15	<1	NT	<1
G-2	1	<1	NT	<1
H-2		50	<1	50
I-2	15	180	<1	180
J-2	1		<1	3,500
J-2	5	3,500		>5,000
J-2	10	>5,000	<1	
K-2	1	70	<1	70
L-2	1	35	<1	35

PPM - Parts per million

BLS - Below Land Surface

TABLE 2 (CONTINUED)
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

	Light West of the Control of the Control			
SOIL SAMPLE IDENTIFICATION	DEPTH OF SAMPLE COLLECTION (IN FEET BLS)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)
L-2	10	3,600	<1	3,600
A-3	1	<1	NT	<1
	1	<1	NT	<1
B-3	1	<1	NT	<1
C-3	1	<1	NT	<1
D-3		<1	NT	<1
E-3	1	<1	NT	<1
F-3	1	<1	NT	<1
G-3	1		NT	<1
Н-3	1	<1		<1
1-3	1	<1	NT	<1
J-3	1	<1	NT	<u> </u>

PPM - Parts per million

BLS - Below Land Surface

TABLE 2 (CONTINUED)
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

SOIL SAMPLE IDENTIFICATION	DEPTH OF SAMPLE COLLECTION (IN FEET)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)
<u></u>	5	>5,000	<1	>5,000
J-3	10	5,000	100	4,900
K-3	1	<1	NT	<1
L-3	1	<1	NT	<1
A-4	1	<1	NT	<1
A-4	5	1,500	<1	1,500
B-4	1	<1	NT	<1
B-4	5	2,300	<1	2,300
C-4	1	<1	NT	<1
C-4	5	2,500	<1	2,500
D-4	1	<1	NT	<1

PPM - Parts per million

BLS - Below Land Surface

TABLE 2 (CONTINUED)
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

SUMMATT OF GOLD						
SOIL SAMPLE IDENTIFICATION	DEPTH OF SAMPLE COLLECTION (IN FEET BLS)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)		
D-4	5	1,000	<1	1,000		
	1	<1	NT	<1		
E-4		<1	NT	<1		
F-4	1		NT	<1		
G-4	1	<1		<1		
H-4	1	<1	NT			
I-4	1	<1	NT	<1		
J-4	1	<1	NT			
	5	5,000	150	4,850		
J-4		5,000	100	4,900		
J-4	10	<1	NT	<1		
K-4	1		NT	<1		
L-4	1	<1		<1		
A-5	1	<1	NT			

PPM - Parts per million

BLS - Below Land Surface

TABLE 2 (CONTINUED)
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

	00			
SOIL SAMPLE IDENTIFICATION	DEPTH OF SAMPLE COLLECTION (IN FEET BLS)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)
	5	3,000	<1	3,000
A-5	1	<1	NT	<1
B-5			NT	<1
B-5	15	<1		
C-5	1	<1	NT	<1
	5	800	<1	800
C-5	1	<1	NT	<1
D-5			<1	1,000
D-5	5	1,000		
D-5	15	<1	NT	<1
	1	<1	NT	<1
E-5		<1 '	NT	<1
F- 5	1	<1		<1
F-5	15	<1	NT	

PPM - Parts per million

BLS - Below Land Surface

TABLE 2 (CONTINUED)
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

SOIL SAMPLE IDENTIFICATION	DEPTH OF SAMPLE COLLECTION (IN FEET BLS)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)
G-5	1	<1	NT	<1
G-5	5	1,000	<1	1,000
H-5	1	<1	NT	<1
H-5	5	1,400	<1	1,400
	1	<1	NT	<1
 	5	2,000	<1	2,000
I-5	15	<1	NT	<1
J-5	1	<1	NT	<1
J-5	5	2,200	<1	2,200
	10	5,000	100	4,900
J-5 K-5	1	<1	NT	<1

PPM - Parts per million

BLS - Below Land Surface

TABLE 2 (CONTINUED)
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

SOIL SAMPLE IDENTIFICATION	DEPTH OF SAMPLE COLLECTION (IN FEET BLS)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)
K-5	5	3,400	<1	3,400
L-5	1	<1	NT	<1
B-7	10	100	10	90
C-7	10	300	20	280
D-7	15	40	<1	40
G-7	15	100	<1	100
I-7	15	60	<1	60
D-8	15	400	100	300
 	15	60	<1	60
	15	1,500	<1	1,500
I-8 	10	5,000	150	4,850

PPM - Parts per million

BLS - Below Land Surface

TABLE 2 (CONTINUED)
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

SOIL SAMPLE IDENTIFICATION	DEPTH OF SAMPLE COLLECTION (IN FEET BLS)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)
	15	<1	NT	<1
J-9	15	<1	NT	<1
B-10	15	50	<1	50
C-10 D-10	15	<1	NT	<1
E-10	15	300	<1	300
G-10	15	<1	NT	<1
H-10	15	150	<1	150
J-10	15	<1	NT	<1
 SS-1	3	<1	NT	<1
 SS-2	3	<1	NT	<1
 \$\$-3	3	<1	NT	<1

PPM - Parts per million

BLS - Below Land Surface

TABLE 2 (CONTINUED)
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

DEPTH OF SAMPLE COLLECTION (IN FEET BLS)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)
3	<1	NT	<1
3	<1	NT	<1
	(IN FEET BLS)	(IN FEET BLS) (PPM) 3	(IN FEET BLS) (PPM) (PPM) 3

PPM - Parts per million

BLS - Below Land Surface

TABLE 2 (CONTINUED)
SUMMARY OF SOIL HEAD-SPACE ANALYSIS

SOIL SAMPLE IDENTIFICATION	DEPTH OF SAMPLE COLLECTION (IN FEET BLS)	TOTAL HYDROCARBON VAPOR RESPONSE (PPM)	METHANE VAPOR RESPONSE (PPM)	CORRECTED VAPOR RESPONSE (PPM)
SS-15	3	<1	NT	<1
	3	<1	NT	<1
SS-17	3	<1	NT	<1
SS-18	3	<1	NT	<1
S-19	3	<1	NT	<1
	3	<1	NT	<1
SS-20	3			<u> </u>

PPM - Parts per million

BLS - Below Land Surface

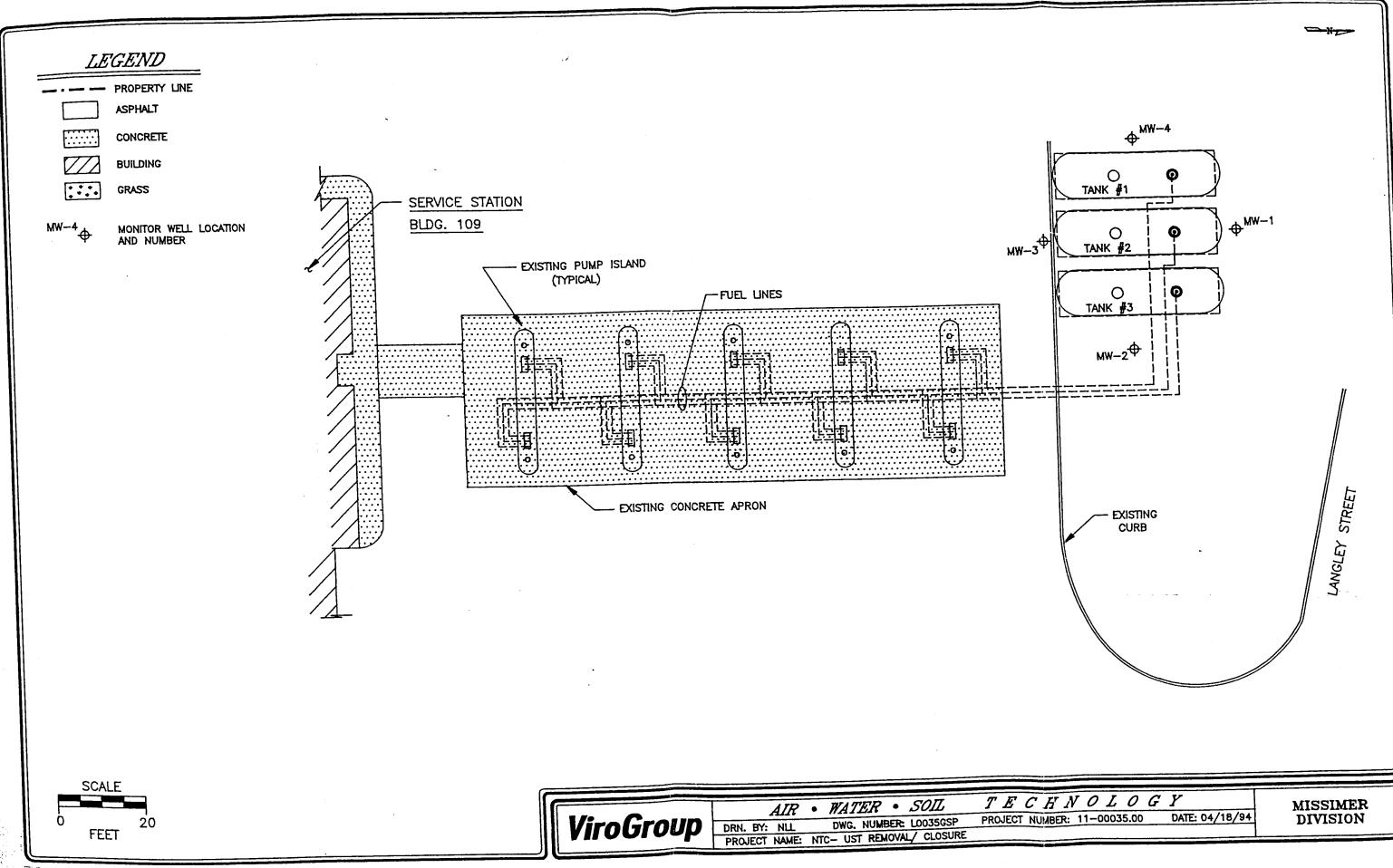
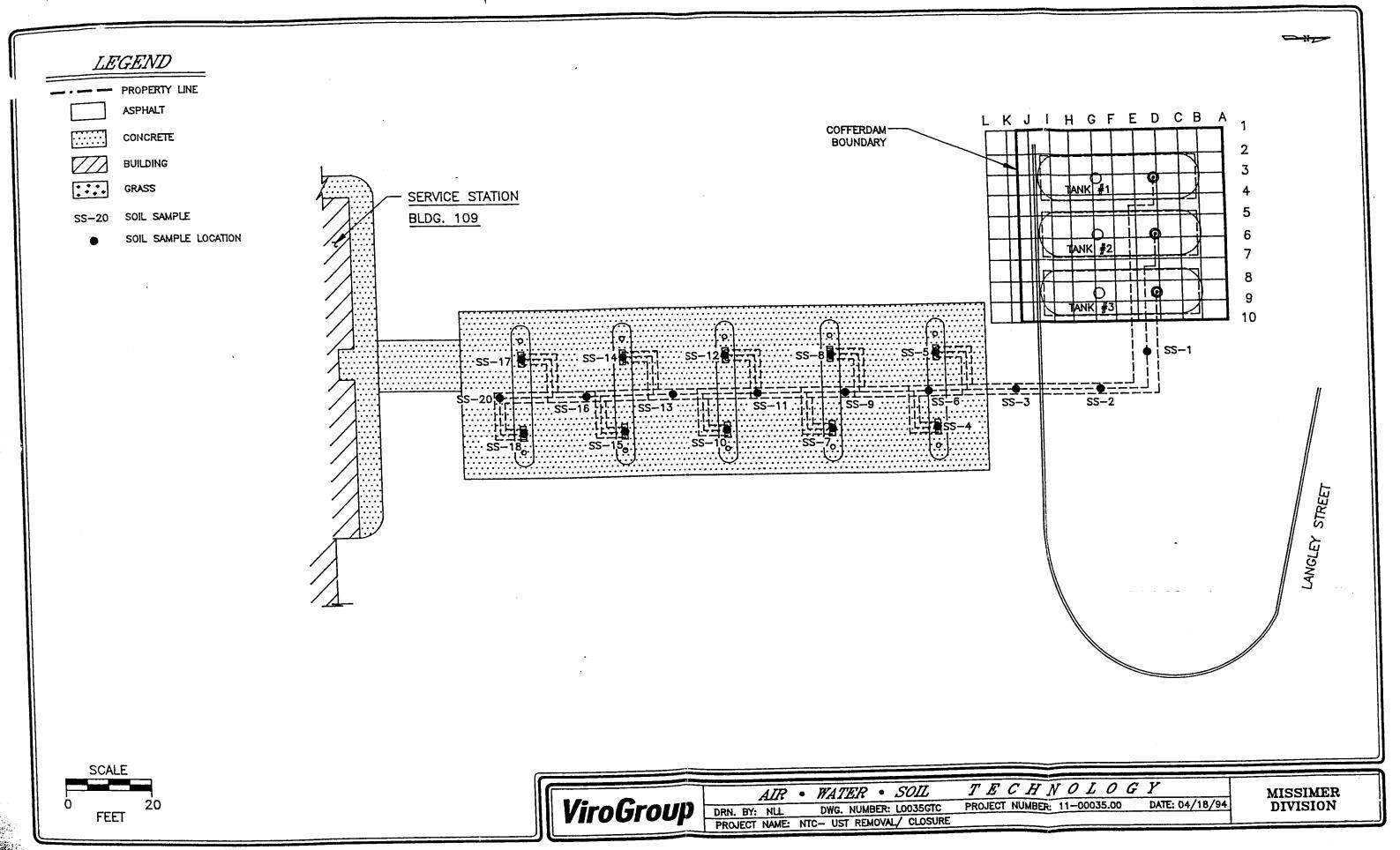


FIG. 1. SITE PLAN



---- BUILDING BER 109 ----NTC ORLANDO FLORIDA MAIN BASE

Lab Sample Number: Site

MB708004

Locator

Collect Date:

109 021GT201/109 TW-2 03-SEP-96 IE QUAL UNITS DL VALUE

Section Sect			
Ethylene dibromide A 601/602 Chloromethane Promomethane 1 U ug/L 1 Dichlorodif luoromethane 1 U ug/L 1,1-Dichlorodif luoromethane 1 U ug/L 1,1-Dichlorodif luoromethane 1 U ug/L 1,1-Dichlorodif luoromethane 1 U ug/L 1,2-Dichlorodif luoromethane 1 U ug/L 1,1-Trichlorodif luoromethane 1 U ug/L 1 U ug/			
Ethylene dibromide A 601/602 Chloromethane Promomethane 1 U ug/L 1 Dichlorodif luoromethane 1 U ug/L 1,1-Dichlorodif luoromethane 1 U ug/L 1,1-Dichlorodif luoromethane 1 U ug/L 1,1-Dichlorodif luoromethane 1 U ug/L 1,2-Dichlorodif luoromethane 1 U ug/L 1,1-Trichlorodif luoromethane 1 U ug/L 1 U ug/			
A 601/602 Chloromethane	DB	_	
Chloromethane 1 U ug/l 1 1 1 1 1 1 1 1 1	Ethylene albromide		
Chloromethane 1 U ug/l 1 1 1 1 1 1 1 1 1	PA 601/602		
Brommethane		1 U ug/l 1	
Dichlorodif Uncromethane		1 U ug/l 1 '	
Vinyl chloride 1 U ug/L 1 Chloroethane 1 U ug/L 5 Methylene chloride 5 U ug/L 5 Trichloroethane 1 U ug/L 1 1,1-Dichloroethane 1 U ug/L 1 1,1-Dichloroethane 1 U ug/L 1 1,2-Dichloroethane 1 U ug/L 1 1,2-Dichloroethane 1 U ug/L 1 1,1-Trichloroethane 1 U ug/L 1 1,1-Trichloroethane 1 U ug/L 1 2arbon tetrachloride 1 U ug/L 1 8 romodichloromethane 1 U ug/L 1 1,2-Dichloropropane 1 U ug/L 1 1,2-Dichloropropane </td <td></td> <td></td> <td>*</td>			*
Methylene chloride			
Trichlorofluoromethane 1 U ug/l 1 1,1-bichloroethene 1 U ug/l 1 1,1-bichloroethene 1 U ug/l 1 1,1-bichloroethene 1 U ug/l 1 1,2-bichloroethene 1 U ug/l 1 1,2-bichloroethane 1 U ug/l 1 1,1-trichloroethane 1 U ug/l 1 1,2-bichloropropane 1 U ug/l 1 1,2-trichloroethane 1 U ug/l 1 1,1,2-trichloroethane 1 U ug/l 1 1,1,2-trichloroethane 1 U ug/l 1 1,1,2-trichloroethane 1 U ug/l 1 1,1,2-trichloropropene 1 U ug/l 1 1,1,2-trichloroethane 1 U ug/l 1 1,1-trichloroethane 1 U ug/l 1 1,1-trichlor			
1,1-Dichloroethane	Methylene chloride		
1,1-Dichloroethane 1 U ug/t	Trichlorofluoromethane		
	1,1-Dichloroethene		
1 U ug/L 1 1 1 1 1 1 1 1 1	1,1-Dichloroethane		
1,2-Dichloroethane			
1,1-Trichloroethane			
Carbon tetrachloride	1,2-Dichtoroethane		
Stromodichloromethane	1,1,1-irichtoroethane		
1			
cis-1,3-Dichloropropene 1 U ug/l 1 Trichloroethene 1 U ug/l 1 Dibromochloromethane 1 U ug/l 1 1,1,2-Trichloroethane 1 U ug/l 1 trans-1,3-Dichloropropene 1 U ug/l 1 Bromoform 1 U ug/l 1 1,1,2,2-Tetrachloroethane 1 U ug/l 1 Tetrachloroethene 1 U ug/l 1 Chlorobenzene 1 U ug/l 1 1,3-Dichlorobenzene 1 U ug/l 1 1,2-Dichlorobenzene 1 U ug/l 1 1,4-Dichlorobenzene 1 U ug/l 1 Methyl tert-butyl ether 1 U ug/l 1 Benzene 1 U ug/l 1 Toluene 1 U ug/l 1 Chlorobenzene 1 U ug/l 1 Ethylbenzene 1 U ug/l 1 Xylenes (total)	1 2-Dichloropropage		
Trichloroethene	cis-1 3-Dichloropropene		
Dibromochloromethane	Trichloroethene		
1,1,2-Trichloroethane 1 U ug/l 1 trans-1,3-Dichloropropene 1 U ug/l 1 Bromoform 1 U ug/l 1 1,1,2,2-Tetrachloroethane 1 U ug/l 1 tetrachloroethene 1 U ug/l 1 Chlorobenzene 1 U ug/l 1 1,3-Dichlorobenzene 1 U ug/l 1 1,2-Dichlorobenzene 1 U ug/l 1 1,4-Dichlorobenzene 1 U ug/l 1 Methyl tert-butyl ether 1 U ug/l 1 Benzene 1 U ug/l 1 Toluene 1 U ug/l 1 Chlorobenzene 1 U ug/l 1 Ethylbenzene 1 U ug/l 1 xylenes (total) - - o-Xylene 1 U ug/l 1	Dibromochloromethane		
Trans-1,3-Dichloropropene	1.1.2-Trichloroethane	1 U ug/l 1	
Bromoform	trans-1,3-Dichloropropene		
Tetrachloroethene 1 U ug/L 1 Chlorobenzene 1 U ug/L 1 1,3-Dichlorobenzene 1 U ug/L 1 1,2-Dichlorobenzene 1 U ug/L 1 1,4-Dichlorobenzene 1 U ug/L 1 1,4-Dichlorobenzene 1 U ug/L 1 Methyl tert-butyl ether 1 U ug/L 1 Benzene 1 U ug/L 1 Toluene 1 U ug/L 1 Chlorobenzene 1 U ug/L 1	Bromoform		
Chlorobenzene 1 U ug/l 1 1,3-Dichlorobenzene 1 U ug/l 1 1,2-Dichlorobenzene 1 U ug/l 1 1,4-Dichlorobenzene 1 U ug/l 1 Methyl tert-butyl ether 1 U ug/l 1 Benzene 1 U ug/l 1 Toluene 1 U ug/l 1 Chlorobenzene 1 U ug/l 1 Ethylbenzene 1 U ug/l 1 Xylenes (total) o-Xylene 1 U ug/l 1			
1,3-Dichlorobenzene			
1 2-Dichlorobenzene 1 U ug/t 1 1,4-Dichlorobenzene 1 U ug/t 1 Methyl tert-butyl ether 1 U ug/t 1 Benzene 1 U ug/t 1 Toluene 1 U ug/t 1 Chlorobenzene 1 U ug/t 1 Ethylbenzene 1 U ug/t 1 Xylenes (total) o-Xylene 1 U ug/t 1			
1	1,3-Dichtorobenzene		
Methyl tert-butyl ether 1 U ug/l 1 Benzene 1 U ug/l 1 Toluene 1 U ug/l 1 Chlorobenzene 1 U ug/l 1 Ethylbenzene 1 U ug/l 1 Xylenes (total) - o-Xylene 1 U ug/l 1	1,2-Dichlorobenzene		
Benzene 1 U ug/L 1 Toluene 1 U ug/L 1 Chlorobenzene 1 U ug/L 1 Ethylbenzene 1 U ug/L 1 Xylenes (total) - - o-Xylene 1 U ug/L 1	1,4-Uichloropenzene		
Toluene 1 U ug/L 1 Chlorobenzene 1 U ug/L 1 Ethylbenzene 1 U ug/L 1 Xylenes (total) o-Xylene 1 U ug/L 1			
Chlorobenzene 1 U ug/l 1 Ethylbenzene 1 U ug/l 1 Xylenes (total)			
Ethylbenzene 1 U ug/l 1 Xylenes (total) o-Xylene 1 U ug/l 1			
Xylenes (total) - o-Xylene 1 U ug/l 1			
o-Xylene 1.U ug/L <u>l</u>	Xvlenes (total)	-	
		2 U ug/l 2	
	••		

---- BUILDING MUMBER 109 ----NTC ORLANDO FLORIDA MAIN BASE

Lab Sample Number: Site Locator Collect Date:

MB708004 109 021GT201/109 TW-2 03-SEP-96

	Collect Date:	VALUE	QUAL UNITS	DL			
LEAD							
Lead			-				
PNA COMPDS							
Naph thalene			-				
2-Methylnaphthalene							
1-Methylnaphthalene Acenaphthylene			-				
Acenaphthene			•			1	
Fluorene			• -				
Phenanthrene Anthracene			-				
Fluoranthene			-				
Pyrene			•				
Benzo (a) anthracene Chrysene			•				
Benzo (b) fluoranthene Benzo (k) fluoranthene			-				
Benzo (k) fluoranthene			-				
Benzo (a) pyrene Indeno (1,2,3-cd) pyren Dibenzo (a,h) anthracen	P		-				
Dibenzo (a,h) anthracen	ė		•				
Benzo (g,h,i) perylene			+				
TOTAL PETROLEUM HYDROCARB	ON						
Total petroleum hydroca	rbon		-				
					•		

---- BUILDING 3ER 109 ----

Lab	Sample Number: Site Locator Collect Date:	000Ri	420001 109 B101/RB-1 -JUL-96 AL UNITS	DL	021GM10 18-	20003 109 01/109 MW-1 JUL-96 AL UNITS	1 DL	02 VALUE	1 1919201 18-J	0004 09 /109 MW-2 UL-96 UNITS	? DL	VALUE	0210 08-N	3001 09 11101 10V-95 UNITS	DL
B Ethylene dibromide		_02 U	ug/l	.02	.02 U	ug/l	.02).)2 U	ug/l	.02	.()2 U	ug/l	.02
A 601/602															
Chloromethane		1 U	ug/t	1	1 U	ug/l	1		1 U	ug/l	1		1 U 1 U	ug/l ug/l	1
Bromomethane		1 U	ug/l	1	1 U	ug/l	1: 4:		1 U 1 U	ug/l ug/l	1		1 0	ug/l ug/l	i
Dichlorodifluoromethane		1 U	ug/l	1	1. U	ug/l	13 1		1 U	ug/l ug/l	1		1 0	ug/l	i
Vinyl chloride		1 U	ug/L	1	1 Ú 1 Ú	ug/l	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1 U	ug/l	1		1 Ü	ug/l	1
Chloroethane		1 U	ug/l	1 5	5 U	ug/l ug/l	5		5 U	ug/l	5		5 Ū	ug/l	5
Methylene chloride		5 U 1 U	ug/l	1	1 U	ug/l	1		1 U ·	ug/l			1 U	ug/l	1
Trichlorofluoromethane		1 0	ug/l ug/l	,	1 0	ug/l	1		1 U	ug/l	1		1 U	ug/l	1
1,1-Dichloroethene		1 Ŭ	ug/l	1	i ŭ	ug/l	1		1 U	ug/l	1		1 บ	ug/l	1
1,1-Dichloroethane trans-1,2-Dichloroether		ίŭ	ug/l	ì	1 Ū	ug/l	1		1 U	ug/l	1		1 U	ug/l	1
	G	1 Ŭ	ug/l	1	1 U	ug/l	1		1 U	ug/l	1		1 U	ug/l]
Chloroform 1,2-Dichloroethane		1 Ŭ	ug/l	1	1 U	ug/l	1		1 U	ug/l	1		1 บ	ug/l	1
1,1,1-Trichloroethane		1 U	ug/l	1	1 บ	ug/l	1		1 U	ug/l	1		1 U	ug/l	1
Carbon tetrachloride		1 U	ug/l	1	1 U	ug/l	1		1 U	ug/l	T.		1 U	ug/l	l 4
Bromodichloromethane		1 U	ug/l	1	1 บ	ug/l	1		1 U	ug/l]		1 U	ug/l	1
1,2-Dichloropropane		1 U	ug/l	1	1 U	ug/l	1		1 U	ug/l]		1 U	ug/l	4
cis-1,3-Dichloropropene)	1 U	ug/l	1	1 U	ug/l	1		1 U	ug/l	1		1 บ 1 บ	ug/l ug/l	1
Trichloroethene		1 U	ug/l		1 U	ug/l	1		1 U	ug/l			1 0	ug/l ug/l	i
Dibromochloromethane		1 U	ug/l	1	1 U	ug/l	1		1 U 1 U	ug/l ug/l	1		1 0	ug/l	i
1,1,2-Trichloroethane		1 U	ug/l	1	1 U	ug/l	1		1 0	ug/l ug/l			1 0	ug/l	i
trans-1,3-Dichloroprope	ene	1 U	ug/L	1	1 U 1 U	ug/l	1		1 U	ug/l	1		1 0	ug/l	1
Bromoform		1 0	ug/l	1	1 U	ug/l ug/l	1		1 Ŭ	ug/l	1		i ŭ	ug/l	1
1,1,2,2-Tetrachloroeth	ine	1 U 1 U	ug/l ug/l	4	1 0	ug/l	i		1 0	ug/l	1		1 U	ug/l	1
Tetrachloroethene		1 0	ug/l	1	1 0	ug/l	1		1 U	ug/l	1		1 U	ug/l	1
Chlorobenzene		1 0	ug/l	1	i ŭ	ug/l	1		1 U	ug/l	1		1 U	ug/l	1
1,3-Dichlorobenzene 1,2-Dichlorobenzene		1 Ŭ	ug/l	1	1 Ū	ug/l	1		1 U	ug/l	1		1 U	ug/l	1
1,4-Dichlorobenzene		10	ug/l	1	1 U	ug/l	1		1 U	ug/l	1		1 U	ug/l	1
Methyl tert-butyl ether		•	•		1 U	ug/l	1		1 U	ug/l	1		1 U	ug/l	1
Benzene					1 U	ug/i	1		1 U	ug/l			1 U	ug/l	1
Toluene					1 U	ug/l	1		1 U	ug/l			1 U	ug/l	1
Chlorobenzene		1 ປ	ug/l	1	1 U	ug/l	1		1 U	ug/l	· · · · · · · · · · · · · · · · · · ·		1 U 1 U	ug/l ug/l	4
Ethylbenzene		-			1 U	ug/l	1		1 U	ug/l			1 U	ug/i ug/i	i
Xylenes (total)		•			-	41	4		- 1 U		4		-	ug/ t	•
o-Xylene		•			1 U	ug/l	1 2		2 U	ug/l ug/l	2		_		
m,p-Xylene		-			2 U	ug/l	2		.c u	ug, t	•				
EAD					4.4		3	27	.4	ug/l	3	4	.5	ug/l	2
Lead		3 U	ug/l	3	14	ug/l	3	دے.		ug/ı		.	••	45/ (_
NA COMPOS													_		
Naphthalene		2 U	ug/l	2	-								-		
2-Methylnaphthalene		2 U	ug/l	2	-								-		
1-Methylnaphthalene		2 U	ug/l	2	-								-		
Acenaphthylene		2 0	ug/l	2 2	-								-		
Acenaphthene		2 U 2 U	ug/l	2	-								-		
Fluorene		Z U:	ug/l	4	-										
		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1													

			_		·
		BUILDING NUMBER 109	SE		
Lab Sample Number: Site Locator Collect Date:	MB420001 109 000RB101/RB-1 18-JUL-96 VALUE QUAL UNITS DL	MB420003 109 021gm101/109 mw-1 18-JUL-96 VALUE QUAL UNITS DL	MB420004 109 021gm201/109 MW-2 18-JUL-96 VALUE QUAL UNITS DL V	G8713001 109 021GT101 08-NOV-95 ALUE QUAL UNITS D	DL
Phenanthrene Anthracene Fluoranthene Pyrene Benzo (a) anthracene Chrysene Benzo (b) fluoranthene Benzo (k) fluoranthene Benzo (a) pyrene Indeno (1,2,3-cd) pyrene Dibenzo (a,h) anthracene Benzo (g,h,i) perylene	2 U ug/l	2		- - - - - - - - -	
TOTAL PETROLEUM HYDROCARBON Total petroleum hydrocarbon	.05 U mg/l .	os -	•	-	

APPENDIX E

GROUNDWATER LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY RECORDS

WELL COMPLETION LOG

Water Mgmt. Dist.:

St. Johns

Site Information:

Permit Number:

Name:

NTC Main Base

Work Order:

6042

Address: C,S,Z:

Orlando, Florida

Type of Well:

Monitor

S/T/R:

Method Used:

Well Number: Idg. 109 MW1 61/4 HSA

Client / Consultant Information

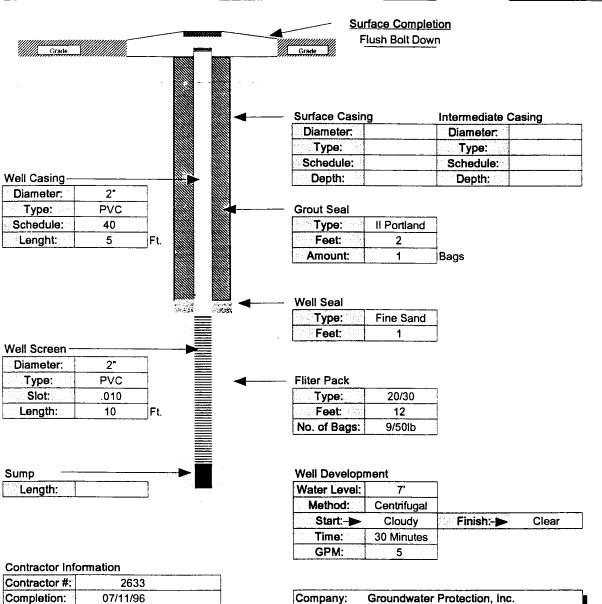
Consultant: **ABB Environmental Services**

Borehole Dia.

<u>10"</u>

Field Rep: Scott Donelick

Well Diameter	Well Type	Well Depth	Screen Length	Casing Length	Bags Grout	Sand Bags/Weight	Filter Type	Well Seal
2"	PVC	15	10	5	1	9/50lb	20/30	Fine Sand
40	Schedule	Slot Size:-▶	.010		2	⋖ − Feet →	12	1



Contractor #:	2633
Completion:	07/11/96
Driller:	Todd Flick
Lead Hand:	Robert Detweiler
3rd Man:	Brian Burgess
Drill Rig:	CME-55

Address: 4315 S.W. 34th Street

C,S,Z: Orlando, Florida 32811

Phone/FAX: (407) 426-7885 / (407) 426-7586

WELL COMPLETION LOG

Water Mgmt, Dist.:

St. Johns

Site Information:

Permit Number:

Name:

NTC

Work Order:

6042

Address: C,S,Z:

Main Base Orlando, Florida

Type of Well:

Monitor

S/T/R:

Well Number: Idg. 109 MW2

Client / Consultant Information

Method Used:

61/4 HSA

Borehole Dia.

<u> 10"</u>

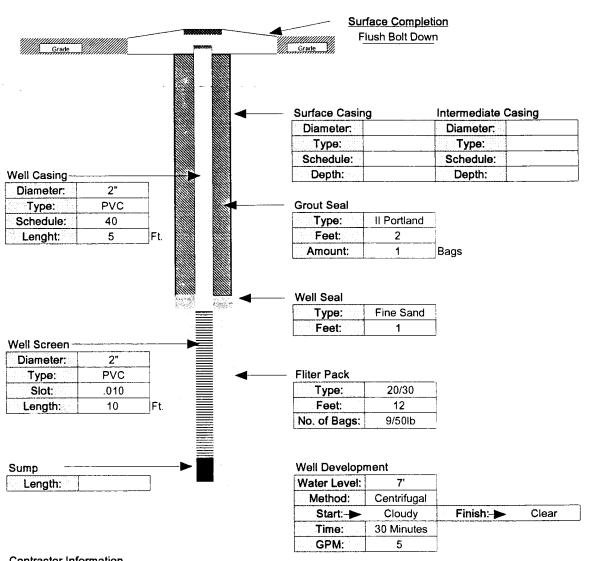
Consultant:

ABB Environmental Services

Field Rep:

Scott Donelick

Well Diameter	Well Type	Well Depth	Screen Length	Casing Length	Bags Grout	Sand Bags/Weight	Filter Type	Well Seal
2"	PVC	15	10	5	1	9/50lb	20/30	Fine Sand
40 ◀-	Schedule	Slot Size:	.010		2	Feet →	12	1



Contractor Information

Contractor #:	2633
Completion:	07/11/96
Driller:	Todd Flick
Lead Hand:	Robert Detweiler
3rd Man:	Brian Burgess
Drill Rig:	CME-55

Groundwater Protection, Inc. Company: Address: 4315 S.W. 34th Street

C,S,Z: Orlando, Florida 32811

(407) 426-7885 / (407) 426-7586 Phone/FAX:

APPENDIX D WELL CONSTRUCTION DETAILS

TITLE: NTC ORLANDO, BUILDING 1	09	 LOG OF	WELL: MW-	2	BORI	NG NO. NA	
CLIENT: U.S. NAVY, SOUTHNAVFAC	ENGCOM				PRO.	JECT ND: 851	19.51
CONTRACTOR: GROUNDWATER PROT	CONTRACTOR: GROUNDWATER PROTECTION, INC. DATE STARTED: 7-11-96						
METHOD: 6.25-INCH ID HSA	CASE SIZE: 2-INCH		SCREEN INT	.: NA	PR01	TECTION LEV	EL: D
TOC ELEV: NM FEET.	MONITOR INST: OVA TOT DPTH:5 - 15 FEET				DPTH	H T□ 🛂 6.5	FEET.
LOGGED BY: S. DONELICK	WELL DEVELOPMEN	T DATE	: 7-11-96			BUILDING 1	109
DEPTH FT. SAMPLE SAMPLE SAMPLE HEADSPACE (ppm)	SDIL/RDCK DE AND COMMENTS		DN	LITHOLOGIC SYMBOLS	SDIL CLASS	BLOWS/6-IN	WELL DATA
	Sand, fine grained, well graded, dry	dark k	rown,		GP		
	Sand, fine grained, moist	tan, we	ell graded,		SP		
5 —	Sand, fine grained, saturated	tan, we	ell graded,		SP		
15	PAGE 1 OF MW-	-2	ABI	B ENVIRONME		SERVICES,	INC

TITLE: NTC ORLANDO, BUILDING 10)9 LOG OF	WELL: NA	BORING NO SB-9			
CLIENT: U.S. NAVY, SOUTHNAVFAC			PROJECT NO: 8519.51			
CONTRACTOR: NA	5 COMPLID 7-11-96					
METHOD: BUCKET AUGER	METHOD: BUCKET AUGER CASE SIZE: NA SCREEN INT.: NA					
TOC ELEV : NA FEET.	MONITOR INST: OVA	TOT DPTH:7 FEET	DPTH TO \$\frac{1}{2}\$ 6.5 FEET			
LOGGED BY: S. DONELICK	WELL DEVELOPMENT DATE	Z: NA	SITE: BUILDING 109			
DEPTH FT. SAMPLE SAMPLE SAMPLE FECTOVERY HEADSPACE (Ppm)	SOIL/ROCK DESCRIPTI AND COMMENTS	Z LITHOLOGIC SYMBOLS	SDIL CLASS MI-9/SAD78 WELL DATA			
	Sand, fine grained, with so (<10%), black to dark brow	ome organics wn, well graded	SP			
	Sand, fine grained, yellow/ moist, well graded	brown,	SP			
5	Sand, fine grained, tan to saturated	light gray,	SP			
			<u>Ā</u>			
10	PAGE 1 OF SB-9	ABB ENVIRONM	ENTAL SERVICES, INC.			

CLIENT, U.S. NAVY, SDUTHNAVTACENCEUM CINTRACTUR GROUNDWATER PROTECTION INC CASE SIZE NA CONTROL 6-25-NICH ID MSA CONTROL 6-25-	TITLE: NTC ORLANDO, BUILDING 10)9	 DG DE	WELL: MW-1		BURIN	NG NG. NA	
NOTHED S.25-INCH ID HAN CASE SIZE NA SCREET INT. NA PROTECTION LEVEL DID CLEV. NM FEET. MONITER INSTRUMENT CATE 7-11-96. SIZE SULDING INP. LASSBATDEN AS SOMELINE SCHMANIN STEMMENT CATE 7-11-96. SIZE SULDING INP. SAMPLE ID S SOME STEMMENT CATE (7-11-96). SIZE SULDING INP. SAMPLE ID S SOME STEMMENT CATE (7-11-96). SIZE SULDING INP. Forever FAIR (6-reg (1') with lundary fine sand poorly graded, dry. SAND, fine grower with some sixt KIDES, brown, nodernotely graded, moist SAND, fine grower with some sixt KIDES, brown, nodernotely graded, saturated. SP. SAND, fine grower with some sixt KIDES, brown, nodernotely graded, saturated. SP. SAND, fine grower with some sixt KIDES, brown, nodernotely graded, saturated.	CLIENT: U.S. NAVY, SOUTHNAVFAC				.51			
TOC ELEV. NM FORT MINITER INST. DVA TOT DOTH 5 -15 FORT DPH 10 SC 6.5 FEST FROM STATE STAT			COMPLID: 7-	-11-5				
LEGGED BY: S. DENELICK WELL DEVELOPMENT DATE: 7-11-95 SITE: BUILDING 109 SDIL/ROCK DESCRIPTION SOME SAMPLE 110 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	METHOD: 6.25-INCH ID HSA	CASE SIZE: NA		SCREEN INT.: NA	4	PROT	ECTION LEVE	L: D ;
LABURATURY II A STATE TO BE SUBJECT TO SUBJECT THE STATE OF SUBJECT TO SUBJEC	TOC ELEV.: NM FEET.	MONITOR INST.: OVA	4	TOT DPTH: 5 -1	5 FEET	DPTH	T□ ¥ 6.5 F	EET.
Send, fine grained with some sit ((10%), brown, noderately graded, noist Sond, fine grained with some sit ((10%), brown, noderately graded, noist Sond, fine grained with some sit ((10%), brown, noderately graded, saturated Sond, fine grained with some sit ((10%), brown, noderately graded, saturated		WELL DEVELOPMEN	T DATE	7-11-96			BUILDING 109	9
Send, fine grained with some sat (CIDZ), brown, moderately graded, ndist Sand, fine grained with some sat (CIDZ), brown, moderately graded, ndist Sand, fine grained with some sat (CIDZ), brown, moderately graded, saturated	DEPTH FT. SAMPLE SAMPLE RECOVERY HEADSPACE (ppm)			JN	LITHOLOGIC SYMBOLS		BLOWS/6-IN	VELL DATA
	5 - 8	fine sand, poorly g Sand, fine grained brown, moderately Sand, fine grained	with soi graded, with soi	me silt ((10%), moist me silt ((10%),		GP SP		
PAGE 1 OF MW-1 ABB ENVIRONMENTAL SERVICES, INC.								

TITLE: NTC ORLANDO, BUILDING 1	09 LOG OF	WELL: NA	BORING NO SB-7		
CLIENT: U.S. NAVY, SOUTHNAVFAC	CLIENT: U.S. NAVY, SOUTHNAVFACENGCOM				
CONTRACTOR: NA		DATE STARTED: 11-7-95	COMPLID 11-7-95		
METHOD: TERRAPROBE SM	CASE SIZE: NA	SCREEN INT: NA	PROTECTION LEVEL: D		
TOC ELEV: NA FEET.	MONITOR INST: OVA	TOT DPTH:7 FEET	DPTH TO ₹ 6.5 FEET.		
LOGGED BY: S. DONELICK	WELL DEVELOPMENT DATE		SITE: BUILDING 109		
DEPTH FT. SAMPLE SAMPLE SAMPLE PECIVERY HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	Z LITHOLOGIC SYMBOLS	SDIL CLASS MI-9/SMOT8 WELL. DATA		
&	Sand, fine grained, tan to da some fine pebbles, dry, moder	rk brown, rately graded	SP		
-	Sand, fine grained, tan, well graded, moist		SP		
5 —	Sand, fine grained, tan, well g saturated	graded,	SP		
			Δ		
10	PAGE 1 OF SB-7	ABB ENVIRONME	NTAL SERVICES, INC.		

TITL	E: NTC ORLANI	DO, BU	ILDING 1	09		WELL: NA		BOR	ING ND. SB-8	3			
CLIE	ENT: U.S. NAVY,	SÜUT	HNAVFA(DENGCOM				PRO	JECT NO: 85	19.51			
CON	TRACTOR: NA					DATE STARTED	11-7-95		COMPLID: 11-7-95				
MET	HOD: TERRAPRO	BE SM		CASE SIZE: NA		SCREEN INT.: N	IA	PRO	PROTECTION LEVEL: D				
	ELEV.: NA FEE			MONITOR INST: 0	DPT	DPTH TO ¥ 6.5 FEET.							
LOG	GED BY: S. DON	NELICK	,						E: BUILDING :	109			
DEPTH FT.	Z A C E			SOIL/ROCK I AND COMMEN	í□N	LITHOLOGIC	SDIL CLASS	BLOWS/6-IN	VELL DATA				
-			æ	Sand, fine grained, t some fine pebbles, o	an to do	irk brown, rately graded		SP					
			Ø	Sand, fine grained, t well graded, moist	an,			SP					
5 -			æ	Sand, fine grained, t saturated	an, well	graded,		SP					
										Ā			
10 -				PAGE 1 DF SB	-8	ABB EN	NVIRONME	NTAL	SERVICES,	INC.			

TITLE: NTC ORLANDO, BUILDING 14	09 LOG 0	WELL: NA	BORING NO. SB-5
CLIENT: U.S. NAVY, SOUTHNAVFAC	ENGCOM		PROJECT NO: 8519.51
CONTRACTOR: NA		DATE STARTED: 11-7-95	COMPLID: 11-7-95
METHOD: TERRAPROBE SM	CASE SIZE: NA	SCREEN INT.: NA	PROTECTION LEVEL: D
TOC ELEV.: NA FEET.	MONITOR INST: OVA	TOT DPTH:7 FEET	DPTH TO ¥ 6.5 FEET.
LOGGED BY: S. DONELICK	WELL DEVELOPMENT DAT	SITE: BUILDING 109	
DEPTH FT. SAMPLE SAMPLE RECOVERY HEADSPACE (ppm)	SOIL/ROCK DESCRIPT AND COMMENTS	E SYMBOLS	SOIL CLASS WELL DATA
	Sand, fine grained, tan to some fine pebbles, dry, mod	dark brown, Herately graded	SP
	Sand, fine grained, tan, well moist	graded,	SP
5 —	Sand, fine grained, tan, well saturated	graded,	SP
			<u> </u>
10	PAGE 1 DF SB-5	ABB ENVIRONME	NTAL SERVICES, INC.

TITLE: NTC ORLANDO, BUILDI	vG 107	LOG OF WELL: NA		BOR	BORING NO. SB-6			
CLIENT: U.S. NAVY, SOUTHNA	/FACENGCOM			PRO	JECT NO: 8519.	51		
CONTRACTOR: NA		DATE STARTE	D: 11-7-95	5 COMPLID: 11-7-95				
METHOD: TERRAPROBE SM	CASE SIZE: NA	SCREEN INT.	NA	PROTECTION LEVEL: D				
TOC ELEV: NA FEET.	MONITOR INST: 0\	/A TOT DPTH:7 F	EET	DPT	DPTH TO \$\frac{1}{2}\$ 6.5 FEET			
LOGGED BY: S. DONELICK	WELL DEVELOPME	NT DATE: NA			E: BUILDING 109	<u> </u>		
DEPTH FT. SAMPLE SAMPLE RECOVERY HEADSPACE	SOIL/ROCK D AND COMMENT		SYMBOLS	SOIL CLASS	BLOWS/6-IN			
	Sand, fine grained, some fine pebbles,	tan to dark brown, dry, moderately graded		SP				
	Sand, fine grained, well graded, moist	tan,		SP				
5								
<i>&</i>	Sand, fine grained, saturated	tan, well graded,		SP				
	PAGE 1 DF SB-	4.D.D. 5.	I) (IDENIMEN	1T A I	 SERVICES, INC.			

TITLE: NTC ORLAN	אטם, אטובטוי	109 	LOG OF	WELL: NA		BORING NO. SB-3				
CLIENT: U.S. NAVY	, SOUTHNAY	/FACENGCOM				PRO	JECT ND: 851	9.51		
CONTRACTOR: NA				DATE STARTED	11-7-95	5	COMPLID: 11-	7-95		
METHOD: BUCKET A	AUGER	CASE SIZE: NA		SCREEN INT.: 1	1A	PRO	TECTION LEV	EL: D		
TOC ELEV.: NA FE	ET.	MONITOR INST.]∨A	TOT DPTH:7 FE	ET	DPT	H T□ 및 6.5	FEET.		
LOGGED BY: S. DO		WELL DEVELOPM	WELL DEVELOPMENT DATE: NA					09		
DEPTH CAST AND THE	RECOVERY HEADSPACE (ppm)	SOIL/ROCK AND COMME	DESCRIPT! NTS	DN	LITHOLOGIC SYMBOLS	SOIL CLASS	BLOWS/6-IN	WELL DATA		
		Sand, fine grain (<10%), black to	ed, with s dark bro	ome organics wn, well graded		SP				
	æ	Sand, fine grain moist, well grad	ed, yellow <i>i</i> ed	/brown		SP				
5 —										
	æ	Sand, fine grain gray, well grade	ed, tan to ed, saturo	light ted		SP		-\		
								-		
10		PAGE 1 DF SI	R-3	V D D E.I		 - NT A I	SERVICES, 1	NC		

TITLE: NTC ORLANDI	T' RAIL DIV	llu 109 	LOG OF WELL: NA					BORING NO. SB-4				
CLIENT: U.S. NAVY,	SOUTHNAV	FACENGCOM				PRO.	JECT NO: 8519.	51				
CONTRACTOR: NA				DATE STARTE	D: 11-7-9	5	COMPLID: 11-7-	95				
METHOD: BUCKET AU	GER	CASE SIZE: NA	-	SCREEN INT.	NA	PROTECTION LEVEL: D						
TOC ELEV: NA FEET		MONITOR INST.	□∨A	TOT DPTH:7	-	DPTH TO ₹ 6.5 FEET.						
_OGGED BY: S. DONE	 LLICK	WELL DEVELOP	MENT DAT	ΓE: NA	-	SITE	: BUILDING 109					
DEPTH FT. SAMPLE SAMPLE SAMPLE PECOVERY HEADSPACE (ppm)			< DESCRIPT		LITHOLOGIC SYMBOLS	SDIL CLASS	BLOWS/6-IN	WELL DATA				
-	æ	Gravel fill (Fin tan, dry, poor	e (1"), with ly graded	n limerock,		GP						
	æ	Sand, fine grai well graded, m	ined, tan t oist	o light gray,		SP						
						SP						
	1	Sand, fine grai well graded, si	ined, dark aturated	brown to tan,				Ā				
10 —		PAGE 1 OF :	S R = 4	۵ تا ۲	FNIVIRINM	FNITAL	SERVICES, INC					

TITLE: NTC ORLANDO, BUILDING	109	9 LOG OF WELL: NA					
CLIENT: U.S. NAVY, SOUTHNAVFA	CENGCOM					ING NO SB-1 JECT NO 8519.	51
CONTRACTOR: NA			DATE STARTED:	11-7-95		COMPLID: 11-7-	-95
METHOD: BUCKET AUGER	CASE SIZE: NA		SCREEN INT.: N	Α	PRO	TECTION LEVEL	. D
TOC ELEVA NA FEET.	MONITOR INST: 0	TOT DPTH:7 FE	ΕT	EET.			
LOGGED BY: S. DONELICK	WELL DEVELOPME		SITE: BUILDING 109				
DEPTH FI. SAMPLE SAMPLE RECOVERY HEADSPACE (PDM)	SOIL/ROCK I		ΠN	LITHOLOGIC SYMBOLS	SDIL CLASS	BLOWS/6-IN	VELL DATA
	Sand, fine grainer (<10%), black to d	d, with so dark bro		SP			
	Sand, fine graine moist, well grade	ol, yellow/ d	brown		SP		
5 —	Sand, fine graine gray, well graded				SP		Ā
10	PAGE 1 OF SB	1	ADD EN	VIDUNME.	JIAI	SERVICES, INC	

TITLE: NTC ORLANDO,	BUILDING 1	09	LOG OF	WELL: NA		BOR	ING NO. SB-2				
CLIENT: U.S. NAVY, SO	UTHNAVFA			PROJECT NO: 8519.							
CONTRACTOR: NA				DATE STARTED:	11-7-95	COMPLID: 11-7-95					
METHOD: BUCKET AUGE	R	CASE SIZE: NA		SCREEN INT.: N	Α	PRO.	ROTECTION LEVEL: D				
TOC ELEV.: NA FEET.		MONITOR INST: 0V	Α	TOT DPTH:7 FE	ET	DPTI	i TO ♀ 6.5 FEET.				
LOGGED BY: S. DONELI		WELL DEVELOPMENT DATE: NA					BUILDING 109				
LABORATORY DE LE LA	HEADSPACE (ppm)	SDIL/ROCK DESCRIPTION AND COMMENTS			LITHOLOGIC SYMBOLS	SDIL CLASS	BLOWS/6-IN	WELL DATA			
	ø	Sand, fine grained, (<10%), black to da	with sor .rk browi	me organics n, well graded		SP					
	<i>&</i>	Sand, fine grained, moist, well graded	yellow/b	orown		SP					
5	8	Sand, fine grained, gray, well graded,	tan to saturat	light ed		SP		Ÿ			
10		PAGE 1 DF SB-2	2	ABB EN	VIRONME	NTAL	SERVICES, INC				

APPENDIX C LITHOLOGIC LOGS

INC. Da # 441 600 1 1 11114

Department of Environmental Protection

Lawton Chiles Governor Twin Towers Building 2600 Blair Stone Road Tallahassee, Florida 32399-2400 Virginia B. Wetherell Secretary

January 19, 1996

Mr. Nick Ugolini
Code 184(PVC)
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
P.O. Box 190010
North Charleston, South Carolina 29419-9010

RE: Petroleum Contamination Assessment, Navy Exchange, Building 109, Naval Training Center, Orlando, Florida

Dear Mr. Ugolini:

I have completed the technical review of your request dated December 2, 1995 (received December 29, 1995), to remove Building 109 from the Petroleum Site Management Plan (SMP) based upon the results from past removal actions and a recent assessment of soil and groundwater by ABB Environmental. I cannot approve the site from being removed from the SMP.

A Contamination Assessment Report should be completed. The information necessary for a CAR is almost done. No more soil analysis is required. However, two additional monitoring wells should be established to verify the direction of ground water flow and the groundwater analyzed for the Gasoline Analytical Group of constituents. One well should be on the west side of the site and the other the east side, as previous analysis found groundwater contamination in these locations.

If I can be of any further assistance with this matter, please contact me at (904) 921-9989.

sincerely,

John W. Mitchell

Remedial Project Manager

Mr. Nick Ugolini January 19, 1996 Page two

Wayne Hansel, Navy SouthDiv cc: Mac McNeil, Bechtel LCDR Catherine Ballinger, NTC Orlando Nancy Rodriquez, USEPA Region 4 Bill Bostwick, FDEP Central District John Kaiser, ABB Orlando Jim Manning, ABB Jacksonville

ESN ESN



CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

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Project # 8519 Project Name		<u> </u>	1				1	urch								-10		novatio	2616 06	.ar	e C 4) 462-10	670	5090 Redd (916)		illar	Road 003-14 FAX (12 916) 2 4	4-410	9	Lab# 687		Page		of /
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Project Name NTC Company Name ABB Project Manager Toka Kaiser	Δ),	rlo	n	d	0											- 1	LMG 2567 Fairlane Drive Montgomery, AL 36116-1622 (205) 271-2440 FAX (205) 271-3428 LKW Canviro Analytical Laboratories, Inc. 50 Bathurst, Unit 12 Waterloo, Ontario, Canada N2V 2C5 (519) 747-9575 FAX (519) 747-380			Ī		11/9/95	(A)P	Q :	3									
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Sample Receipt Record

Batch Number:	68713			Date received:	11-9-95		
Client/Project:		0/0-0/0					
	ABB NTC	_					
VERIFICATI	ON OF SAMPI	E CONDITION	ONS (verify al	l items)			120
		Observa	ation			YES	NO
	Is intact and on the		oler?			\ <u>\</u>	
	Custody inside the					1	
	Custody properly fi					1	+
Were the sample	containers in good o	ondition?			. %	1/2	+
Was there ice in t	the cooler? Enter ter	mperature of tem	perature blank (or icewater:	· 4°C	1 /	
If the answer to	any of the questions	above is NO, a S	Sample Receipt	Exceptions Report	musi de writen.		
	ON OF SAMPL			y all preserved sample	Other (specify)	Other	(specify)
Sample No	Nutrients	Metals	Volatiles	Cyanide	Outer ispectify		
		< 2	<2				
		•	CATIONS PER	FORMED BY			
13	North	11.9.9	<u> </u>	- -	<u></u>	Dat	
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		WET C	CHEMISTRY AI	LIQUOTS Valk-in cold ro	om		
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-2			VOA ALIQUO		e cold area		
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QAL Gainesville

CHAIN OF CUSTODY DOCUMENTATION

Report of Analytical Results 504-ETHYLENE DIBROMIDE (EDB)

Date Collected: 11/08/95 Date Received: 11/09/95

Date Extracted: None Date Analyzed: 11/13/95 Client Sample ID: 021GT101 Lab ReferenceNum: G8713

G8713001 Sample ID: Sample Matrix: Water Sample Description: 109-TW1

1.00 Dilution:

Analytical Parameter		CAS/Storet Number	Result	Units	Reporting Level
GC VOLATILES 1,2-Dibromoethane 1,1,2-Trichloroethane	- SS	106-93-4 79-00-5	0.02 U 103	ug/L %rec	0.02

Report of Analytical Results 504-ETHYLENE DIBROMIDE (EDB)

Date Collected: None Date Received: None Date Extracted: None

Date Analyzed: 11/13/95

Client Sample ID: WEDB5M131

Lab ReferenceNum: LABQC

Sample ID: Sample Matrix: WEDB5M131 Water

Sample Description: None Dilution:

1.00

Analytical Parameter	CAS/Storet Number	Result	Units	Reporting Level
GC VOLATILES 1,2-Dibromoethane 1,1,2-Trichloroethane - SS	106-93-4 79-00-5	0.02 U 104		0.02

CASE NARRATIVE GC EXTRACTABLE VOLATILE ORGANICS (EDB/DBCP)

QAL La	ab Reference No./SDGG6713
Proje	ct: Orlando UST: Work Release 527
I.	RECEIPT
	No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.
II.	HOLDING TIMES
	A. Sample Preparation: All holding times were met.
	B. Sample Analysis: All holding times were met.
III.	METHOD
	Preparation: N/A Cleanup: N/A Analysis: EPA 504
IV.	PREPARATION
	Sample preparation proceeded normally.
v.	ANALYSIS
	A. Calibration: All acceptance criteria were met.
	B. Blanks: All acceptance criteria were met.
	C. Surrogates: All acceptance criteria were met.
	D. Spikes: All acceptance criteria were met.
	E. Samples: Sample analyses proceeded normally.
agre exce hard	rtify that this data package is in compliance with the terms and conditions ed to by the client and QAL, Inc., both technically and for completeness, but for the conditions noted above. Release of the data contained in this copy data package has been authorized by the Laboratory Manager or designated con, as verified by the following signature.
SIGN	NED: Steve Shaley for 1616 Kelly DATE: 11-14-95 Herb Kelly Organic Division Manager

GC EXTRACTABLE VOLATILE ORGANICS (EDB/DBCP)
Lab Reference No./SDG: G8713
Page 2

CASE NARRATIVE Addendum

Sample Information

LAB CLIENT SAMPLE DATE DATE SAMPLE ID MATRIX SAMPLED EXTRACTE G8713001 021GT101 Water 11/08/95 11/13/95 WEDB5M131 WEDB5M131 Water N/A 11/13/95	DATE SAMPLE ANALYZED pH¹ 11/13/95 <2 11/13/95 N/A
--	---

¹ Applies to samples designated for purgeable VOA analysis only.

GC EXTRACTABLE VOLATILE ORGANICS (EDB/DBCP)

Report of Analytical Results 601/602(MOD)-HALOCARB/AROM, STD LIST, W/WW

Date Collected: 11/08/95 Date Received: 11/09/95 Date Extracted: None Date Analyzed: 11/11/95 Client Sample ID: 021GT101 Lab ReferenceNum: G8713

Sample ID: Sample Matrix: Sample Description: 109-TW1 Dilution:

G8713001 Water 1.00

Analytical Parameter	CAS/Storet Number	Result	Units	Reporting Level	
GC VOLATILES					
Chloromethane	74-87-3	1.0 U	ug/L	1.0	
Promomethane	74-83-9	1.0 U	ug/L	1.0	
Dichlorodifluoromethane	75-71-8	1.0 U	ug/L	1.0	
Vinvl chloride	75-01-4	1.0 U	ug/L	1.0	
Chloroethane	75-00 <i>-</i> 3	1.0 U	ug/L	1.0	
Dichloromethane (Methylene chloride)	75-09-2	5.0 U	ug/L	5.0	
Trichlorofluoromethane	75-69-4	1.0 U	ug/L	1.0	
1,1-Dichloroethene	75-35-4	1.0 U	ug/L	1.0	
1.1-Dichloroethane	75-34-3	1.0 U	ug/L	1.0	
trans-1.2-Dichloroethene	156-60-5	1.0 U	ug/L	1.0	
Chloroform	67-66-3	1.0 U	ug/L	1.0	
1,2-Dichloroethane	107-06-2	1.0 U	ug/L	1.0	
1,1,1-Trichloroethane	71-55-6	1.0 U	ug/L	1.0	
Carbon tetrachloride	56-23-5	1.0 U	ug/L	1.0	
Bromodichloromethane	75-27-4	1.0 U	ug/L	1.0	
1,2-Dichloropropane	78-87-5	1.0 U	ug/L	1.0	
cis-1,3-Dichloropropene	10061-01-5	1.0 U	ug/L	1.0	
Trichloroethene	79-01-6	1.0 U	ug/L	1.0	
Dibromochloromethane	124-48-1	1.0 U	ug/L	1.0	
1.1.2-Trichloroethane	79-00-5	1.0 U	ug/L	1.0	
trans-1,3-Dichloropropene	10061-02-6	1.0 U	ug/L	1.0	
Bromoform	75-25-2	1.0 U	ug/L	1.0	
1,1,2,2-Tetrachloroethane	79-34-5	1.0 U	ug/L	1.0	
Tetrachloroethene	127-18-4	1.0 U	ug/L	1.0	
Chlorobenzene	108-90-7	1.0 U	ug/L	1.0	
1,3-Dichlorobenzene	541-73-1	1.0 U	ug/L	1.0	
1,2-Dichtorobenzene	95-50-1	1.0 U	ug/L	1.0	
1.4-Dichlorobenzene	106-46-7	1.0 U	ug/L	1.0	
	1634-04-4	1.0 U	ug/L	1.0	
tert-Butyl methyl ether Benzene	71:43:2	1.0 U	ug/L	1.0	
	108-88-3	1.0 U	ug/L	1.0	
Toluene	100-41-4	1.0 U	ug/L	1.0	
Ethylbenzene	1330-20-7	1.0 U	ug/L	1.0	
Xylenes (Total)	462-06-6	102	%rec		
Fluorobenzene - SS	402-00-0	102	AI CC		

Report of Analytical Results 601/602(MOD)-HALOCARB/AROM,STD LIST,W/WW

Date Collected: None
Date Received: None
Date Extracted: None
Date Analyzed: 11/11/95

Client Sample ID: WGV65M111 Lab ReferenceNum: LABQC Sample ID: WGV65M111
Sample Matrix: Water
Sample Description: None
Dilution: 1.00

Analytical Parameter	CAS/Storet Number	Result	Units	Reporting Level
GC VOLATILES				
Chioromethane	74-87-3	1.0 U	ug/L	1.0
Bromomethane	74-83-9	1.0 U	ug/L	1.0
Dichlorodifluoromethane	75-71-8	1.0 U	ug/L	1.0
Vinyl chloride	75-01-4	1.0 U	ug/L	1.0
Chloroethane	75-00-3	1.0 U	ug/L	1.0
Dichloromethane (Methylene chloride)	75-09-2	5.0 U	ug/L	5.0
Trichlorofluoromethane	75-69-4	1.0 U	ug/L	1.0
1.1-Dichloroethene	75-35-4	1.0 ປ	ug/L	1.0
1.1-Dichloroethane	75-34-3	1.0 U	ug/L	1.0
trans-1,2-Dichloroethene	156-60-5	1.0 U	ug/L	1.0
Chloroform	67-66-3	1.0 U	ug/L	1.0
1.2-Dichloroethane	107-06-2	1.0 U	ug/L	1.0
1,1,1-Trichloroethane	71-55-6	1.0 U	ug/L	1.0
Carbon tetrachloride	56-23-5	1.0 U	ug/L	1.0
Bromodichloromethane	75-27-4	1.0 บ	ug/L	1.0
1.2-Dichloropropane	78-87-5	1.0 U	ug/L	1.0
cis-1.3-Dichloropropene	10061-01-5	1.0 U	ug/L	1.0
Trichloroethene	79-01-6	1.0 ປ	ug/L	1.0
Dibromochloromethane	124-48-1	1.0 U	ug/L	1.0
1.1.2-Trichloroethane	79-00-5	1.0 U	ug/L	1.0
trans-1.3-Dichloropropene	10061-02-6	1.0 บ	ug/L	1.0
Bromoform	75-25-2	1.0 U	ug/L	1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0 U	ug/L	1.0
Tetrachloroethene	127-18-4	1.0 U	ug/L	1.0
Chlorobenzene	108-90-7	1.0 ປ	ug/L	1.0
1.3-Dichlorobenzene	541-73-1	1.0 U	ug/L	1.0
1,2-Dichlorobenzene	95-50-1	1.0 ປ	ug/L	1.0
1.4-Dichlorobenzene	106-46-7	1.0 U	ug/L	1.0
tert-Butyl methyl ether	1634-04-4	1.0 U	ug/L	1.0
Benzene	71-43-2	1.0 U	ug/L	1.0
Toluene	108-88-3	1.0 U	ug/L	1.0
Ethylbenzene	100-41-4	1.0 U	ug/L	1.0
Xylenes (Total)	1330-20-7	1.0 U	ug/L	1.0
Fluorobenzene - SS	462-06-6	98	%rec	

CASE NARRATIVE GC PURGEABLE HALOCARBONS/AROMATICS

QAL Lab Reference No./SDG. ____G8713

Projec	ct: Orlando UST: Work Release 527
I.	RECEIPT No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.
II.	HOLDING TIMES
	A. Sample Preparation: All holding times were met.
	B. Sample Analysis: All holding times were met.
III.	METHOD
	Preparation: N/A Cleanup: N/A Analysis: EPA 601/602
IV.	PREPARATION
	Sample preparation proceeded normally.
v.	ANALYSIS
	A. Calibration: All acceptance criteria were met.
	B. Blanks: All acceptance criteria were met.
	C. Surrogates: All acceptance criteria were met.
	D. Spikes: All acceptance criteria were met.
	E. Samples: Sample analyses proceeded normally.
agree excep harde	rtify that this data package is in compliance with the terms and conditions ed to by the client and QAL, Inc., both technically and for completeness, pt for the conditions noted above. Release of the data contained in this copy data package has been authorized by the Laboratory Manager or designated on, as verified by the following signature. ED: DATE: 1/13/95
SIGN	Herb Kelly Organic Division Manager

GC PURGEABLE HALOCARBONS/AROMATICS Lab Reference No./SDG: <u>G8713</u> Page 2

CASE NARRATIVE Addendum

Sample Information

LAB CLIENT SAMPLE DATE SAMPLE ID SAMPLE ID MATRIX SAMPLED EXTRACTED ANALYZED 1 GR713001 021GT101 Water 11/08/95 N/A 11/11/95	AMPLE pH ¹ <2 N/A
--	---------------------------------------

¹ Applies to samples designated for purgeable VOA analysis only.

GC PURGEABLE HALOCARBONS/AROMATICS

Report of Analytical Results

Parameter: Lead

Method: EPA239.2/SW7421

Project Name:

Orlando UST: Work Release 527

Date Received: 11/09/95 Lab Reference No: G8713

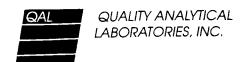
Lab Sample ID	Client Sample ID	Result	Units	Reporting Level	Date Collected	Date Analyzed	Sample Matrix
G8713001 WA11095FN02B	021GT101 METHOD BLANK	4.5 < 2.0	ug/L ug/L	2.0 2.0	11/08/95 None	11/10/95 11/10/95	Water Water

CASE NARRATIVE CATIONS

QAL La	ab Reference No./SDGG8713
Projec	ct:Orlando UST: Work Release 527
ı.	RECEIPT
	No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.
II.	HOLDING TIMES
	All holding times were met.
III.	METHOD
	The method used is cited in the corresponding Form I.
IV.	PREPARATION
	Sample preparation proceeded normally, if applicable.
v.	ANALYSIS
	A. Calibration: All acceptance criteria were met.
	B. Blanks: All acceptance criteria were met.
	C. Spikes: All acceptance criteria were met.
	D. Duplicates: All acceptance criteria were met.
	E. Laboratory Control Samples: All acceptance criteria were met.
	F. Samples: Sample analyses proceeded normally.
agree excep harde	rtify that this data package is in compliance with the terms and conditions ed to by the client and QAL, Inc., both technically and for completeness, pt for the conditions noted above. Release of the data contained in this copy data package has been authorized by the Laboratory Manager or designated on, as verified by the following signature.

Isaac Lynch Manager, Inorganics Department SIGNED:

CATIONS



Sample ID Cross-reference Table

QAL, Inc.	Client	Collect	Additional Description
Lab Sample	ID Sample ID	Date Sample Matrix	
FS = Field	: Sample; NON = No	on-Sample (Administrative Only	y)
G8713000	NON EDATA	11/08/95 Administration	109-TW1
G8713001	FS 021GT101	11/08/95 Water	

The above lab sample ID's and cross reference information apply to samples as received by the laboratory. Modifiers to the lab sample ID may be added for internal tracking purposes. Any modified sample ID will be reflected in the appropriate case narrative only.

Organic Data Qualifiers

- A -- This qualifier indicates that a TIC is a suspected aldol-condensation product.
- B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests that the data user evaluate these compounds and their amounts carefully.
- C -- The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.
- D -- This qualifier is used for all compounds identified in an analysis at a secondary dilution factor. "D" qualifiers are used only for the samples reported at more than one dilution factor.
- E -- This flag indicates that the value reported exceeds the linear calibration range for that compound. Therefore, the sample should be reanalyzed at an appropriate dilution. The "E" qualified amount is an estimated concentration, and the results of the dilution will be reported on a separate Form I.
- I -- This qualifier indicates that the reporting limit adjacent to the "I" qualifier has been raised. It is used when chromatographic interference prohibits detection of a compound at a level below the concentration expressed on the Form I.
- J -- Indicates an estimated value. It is used when the data indicates the presence of a target compound below the reporting limit or the presence of a Tentatively Identified Compound (TIC).
- N -- This qualifier indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the "N" qualifier is not used.
- P -- This qualifier is used for pesticide/Aroclor target analytes when there is a greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a "P".
- U -- Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the reporting limit for that compound. The reporting limit can vary from sample to sample depending on dilution factors or percent moisture adjustments when indicated.

Organic Sample ID Qualifiers

The qualifiers that may be appended to the Lab Sample ID and/or the Client Sample ID for organic analyses are defined below:

- DL -- Diluted reanalysis. Indicates that the results were determined in an analysis of a secondary dilution of a sample or extract. The "DL" suffix may be followed by a digit to indicate multiple dilutions of the sample or extract. The results of more than one diluted reanalyses may be reported.
- MS -- Matrix spike (may be followed by a digit to indicate multiple matrix spikes within a sample set).
- MSD Matrix spike duplicate (may be followed by a digit to indicate multiple matrix spikes within a sample set).
- R -- Reanalysis. The extract was reanalyzed without re-extraction. The "R" is not used if the sample was also re-extracted. May be followed by a digit to indicate multiple reanalyses of the sample at the same dilution.
- RE -- Re-extraction analysis. The sample was re-extracted and reanalyzed. May be followed by a digit to indicate multiple re-extracted analyses of the sample at the same dilution.

TABLE OF CONTENTS

QAL Lab Reference No./SDG: G8713 Level 1

																						Pag <u>No</u>	•
Organi	c Data Qualifier	s				-																. :	i
Organi	c Sample ID Qual	ifiers																				i:	i
Sample	Identification	Cross-Re	efer	ence	∍ .	•		•		•		•		•	•		•	•	•	•	•	ii	i
CATION	S																						1
	Case Narrative(s	s)															•				•		2
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	Case Narrative						•				•	•		•			•		•	•	•	1	.0
	Sample Results																						
Chain	of Custody Docu	mentatio	n																			1	.4



FILE COPY

November 14, 1995

RECEIVED NOV 1 5 1995

Manuel Alonso ABB Environmental Services 1080 Woodcock Road, Suite 100 Orlando, FL 32803

RE: Analytical Data for

Orlando UST: Work Release 527

OAL Reference G8713

Dec - Promoter

Dear Manuel Alonso:

On November 9, 1995, QAL, Inc. received samples with a request for analysis. The analytical results and associated quality control data are enclosed.

It is our policy to store your samples for 30 days from the date of this letter. If extended storage is required, special arrangements can be accommodated upon early notification. The disposition of samples identified as hazardous will require special handling and you will be contacted if necessary.

QAL, Inc. appreciates your business and looks forward to serving you again. If you have any questions concerning your report or need any additional information, please call me at (904) 462-3050.

Sincerely,

Beth Elm for

Karen Daniels Project Manager/Client Services

Enclosures

xc: John McVoy

Manuel Alonso

ATTACHMENT B

ADDENDUM 2

CONTAMINATION ASSESSMENT REPORT, BUILDING 7174, McCOY ANNEX

CONTAMINATION ASSESSMENT REPORT

BUILDING 7174 McCOY ANNEX EXCHANGE SERVICE STATION

NAVAL TRAINING CENTER ORLANDO, FLORIDA

Unit Identification Code: N65928

Contract No. N62467-89-D-0317/107

Prepared by:

ABB Environmental Services, Inc. 2590 Executive Center Circle, East Tallahassee, Florida 32301

Prepared for:

Department of the Navy, Southern Division Naval Facilities Engineering Command 2155 Eagle Drive North Charleston, South Carolina 29418

Nick Ugolini, Code 1843, Engineer-in-Charge

October 1996



CERTIFICATION OF TECHNICAL DATA CONFORMITY (MAY 1987)

The Contractor, ABB Environmental Services, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/107 are complete and accurate and comply with all requirements of this contract.

DATE:	October	11,	1996	

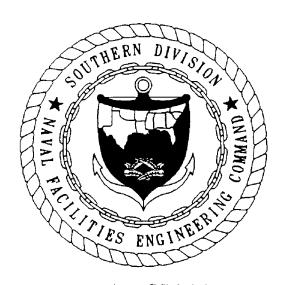
NAME AND TITLE OF CERTIFYING OFFICIAL:

John Kaiser

Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL:

Manuel Alonso, P.G. Project Technical Lead



FOREWORD

To meet its mission objectives, the U.S. Navy performs a variety of operations, some requiring the use, handling, storage, or disposal of hazardous materials. Through accidental spills and leaks and conventional methods of past disposal, hazardous materials may have entered the environment in ways unacceptable by today's standards. With growing knowledge of the long-term effects of hazardous materials on the environment, the Department of Defense initiated various programs to investigate and remediate conditions related to suspected past releases of hazardous materials at their facilities.

One of these programs is the Comprehensive Long-Term Environmental Action, Navy Underground Storage Tank (UST) program. This program complies with Subtitle I of the Resource Conservation and Recovery Act and the Hazardous and Solid Waste Amendments of 1984. In addition, the UST program complies with all State and local storage tank regulations as they pertain to the locations of each naval facility.

The UST program includes the following activities:

- registration and management of Navy and Marine Corps storage tank systems,
- contamination assessment planning,
- site field investigations,
- preparation of contamination assessment reports,
- remedial (corrective) action planning,
- implementation of the remedial action plans, and
- tank and pipeline closures.

The Southern Division, Naval Facilities Engineering Command manages the UST program, and the Florida Department of Environmental Protection oversees the Navy UST program at the Naval Training Center (NTC), Orlando, Florida.

In addition to the UST program, NTC, Orlando in conjunction with the Department of the Navy has instituted several programs to address the requirements of Base Realignment and Closure (BRAC). BRAC Cleanup Teams composed of representatives from the Navy, as well as Federal and State regulatory agencies, have been formed to address the multitude of issues surrounding base closure and to enhance environmental decision making at BRAC installations where property will be available for transfer to the community. This team approach is intended to foster partnering, accelerate the environmental cleanup process, and expedite timely, cost-effective, and environmentally responsible disposal and reuse decisions.

At NTC, Orlando, the BRAC process includes the evaluation of the environmental condition of the property to ensure the suitability of transfer, reuse, or lease.

Questions regarding the UST program at the NTC, Orlando should be addressed to Mr. Nick Ugolini, Code 1843, at (803) 820-5596.

EXECUTIVE SUMMARY

ABB Environmental Services, Inc. (ABB-ES) has been authorized by Southern Division, Naval Facilities Engineering Command to prepare contamination assessment reports (CARs) for petroleum-impacted sites discovered during the Base Realignment and Closure (BRAC) tank management plan implementation at Naval Training Center, Orlando McCoy Annex property in Orange County Florida. This CAR has been prepared to evaluate current soil and groundwater conditions and to summarizes assessment activities conducted at Building 7174, the former Exchange Service Station, McCoy Annex.

This contamination assessment (CA) has been conducted following the guidelines contained in Section 62-770,600, Florida Administrative Code. A brief summary of the assessment results is provided below, and Table 1 summarizes the different events.

- A total of 10 underground storage tanks (USTs) has been operated in this facility. In 1942, six gasoline USTs were installed (five 5,000-gallon and one 3,000-gallon) and later abandoned in-place after showing inventory losses. In 1986, four 10,000-gallon fiberglass USTs were installed, and in 1994, these USTs were removed along with approximately 250 cubic yards of excessively contaminated soil. Today, no petroleum storage systems are operated at this facility.
- A strong petroleum odor in the compliance wells was noted in 1988, and E.C. Jordan was contacted to conduct a preliminary contamination assessment (PCA), which included precision testing of tanks 7174-7 through 7174-10 and their associated piping. During the PCA, groundwater testing confirmed petroleum impact to groundwater and recommended that a CA be conducted at the site.
- A CAR was completed for the site in August of 1991. A total of 18 shallow monitoring wells and 1 deep monitoring well were installed at the site during the CA.
- In 1993, a remedial action plan (RAP) was completed for the site. The RAP consisted of a pump-and-treat system and a vacuum extraction system (ABB-ES, 1993). Following review comments from Florida Department of Environmental Protection, two addendums to the RAP were prepared for the site.
- In April 1995, the monitoring wells were sampled, and modifications to the recovery well locations prompted an additional soil investigation.
- Based on the findings of April 1995, it was determined that the CA was outdated and that soil and groundwater delineation was needed in order to modify the RAP.
- CA activities were conducted by ABB-ES from October 1995 to August 1996. Thirty-five soil borings were installed throughout the study area to assess the extent of petroleum-impacted soil. The results

of the soil assessment confirmed that the plume has traveled towards the southeast.

- Four additional shallow monitoring wells were installed to assess petroleum impact to groundwater towards the southeast of the site. In addition, nine piezometers were installed to assess the extent of free product discovered near the former petroleum pipeline in the vicinity of the southwestern pump island.
- Groundwater flow direction was found to be from northeast to southwest, with a hydraulic gradient of 0.0125 foot per foot. The hydraulic conductivity was calculated to be 46.9 feet per year, and the transmissivity was estimated to be 105.37 square-foot per day.
- No active potable water wells are located within 0.25 mile of this site.
- ABB-ES recommends that an RAP be prepared to remediate groundwater and soil impacted by petroleum product at this site and to remove free product that now exists.

Table 1 Building 7174 Summary

Date	Action and Comment
1942	Original steel tanks installed.
1986	Six tanks abandoned in place (no records available).
1986	Four 10,000-fiber tanks installed to the east.
1988	E.C. Jordan conducted a PCA based on petroleum odor and conducted a CAR.
August 1991	CAR completed by ABB-ES.
1993	RAP plus 2 addendum completed by ABB-ES and OHM.
January 1995	Four fiber tanks were removed with 250 CYDs.
April 1995	Redesign based on plume change.
May 1995	RAP delayed because of change in site conditions.
July 1995	FDEP issues letter to redo CAR and RAP.
October 1995	Resample soil.
October 1996	CAR assessment completed.
CAR = C RAP = r	oreliminary contamination assessment. contamination assessment report. contamination plan. Florida Department of Environmental Protection.

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GLOSSARY

ABB-ES ABB Environmental Services, Inc. Bechtel Environmental, Inc. BEI below land surface bls CA contamination assessment CAR contamination assessment report FAC Florida Administrative Code FDEP Florida Department of Environmental Protection ft/day feet per day ft2/day square feet per day ft/ft foot per foot Ι hydraulic gradient K hydraulic conductivity KAG Kerosene Analytical Group $\mu g/l$ micrograms per liter porosity NTC Naval Training Center OVA organic vapor analyzer PAH polynuclear aromatic hydrocarbon PCA preliminary contamination assessment PVC polyvinyl chloride remedial action plan RAP SVE soil vapor extraction Τ transmissivity TOC top of casing USEPA U. S. Environmental Protection Agency UST underground storage tank V velocity VOA volatile organic aromatic VOH volatile organic halocarbons

1.0 SITE DESCRIPTION AND BACKGROUND INFORMATION

McCoy Annex is located about 12 miles south of the Naval Training Center (NTC) in Orlando, Orange County, Florida. It occupies 877 acres and is situated adjacent to the west side of Orlando International Airport. McCoy Annex serves mainly as a housing and community support center for the NTC, Orlando complex. The area of investigation is McCoy Annex, Exchange Services Station, Building 7174, located on the northeast corner of Binnacle Way and Daetwyler Drive (Figure 1-1).

In 1942, six gasoline underground storage tanks (USTs) (7174-1 through 7174-6) were installed at the site (one 3,000-gallon tank and five 5,000-gallon tanks). The tanks were abandoned in 1986 and were filled with sand and concrete to conform with Florida Department of Environmental Protection (FDEP) abandonment procedures. In 1986, four 10,000-gallon tanks (7174-7 through 7174-10) were installed in an area to the east of the abandoned tanks (Figure 1-2). Four compliance wells were installed (Old-7174-1 through Old-7174-4) in association with the new tank construction to meet FDEP monitoring requirements. During sampling of the compliance monitoring wells by Naval personnel on June 15, 1988, a petroleum odor was detected in wells Old-7174-1, Old-7174-2, and Old7174-3. E.C. Jordan was contacted to conduct a preliminary contamination assessment (PCA) on the site as a result of this detection.

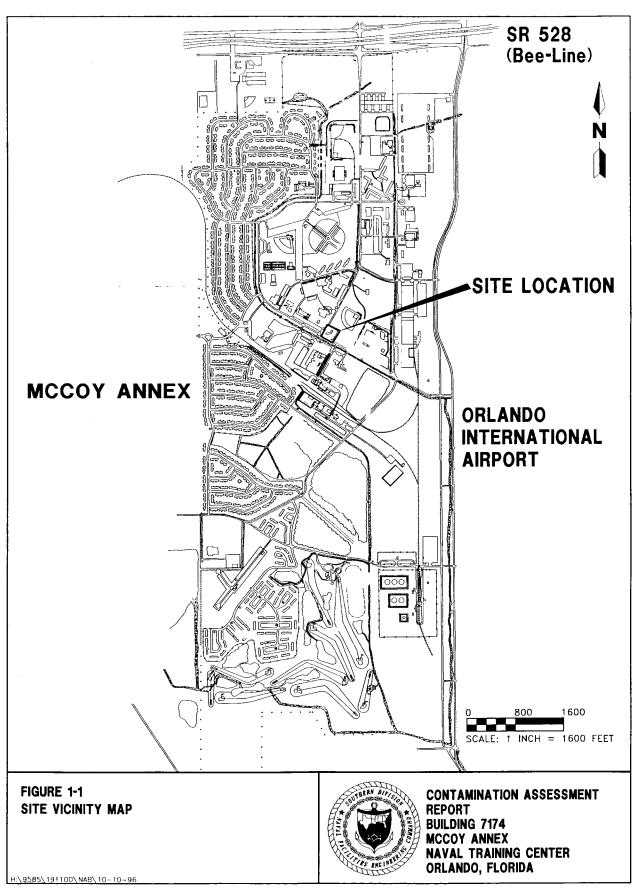
E.C. Jordan personnel completed a PCA in 1988 that included precision testing of tanks 7174-7 through 7174-10 and their associated piping. During the PCA, E.C. Jordan personnel installed an additional six monitoring wells (Old-7174-5 through Old-7174-10). Results from the PCA were that the tanks and their associated piping were not leaking; however, it was observed that the annuli around the tank fill ports were not properly sealed. Groundwater testing confirmed that contamination was present and it was recommended that a contamination assessment (CA) be conducted at the site.

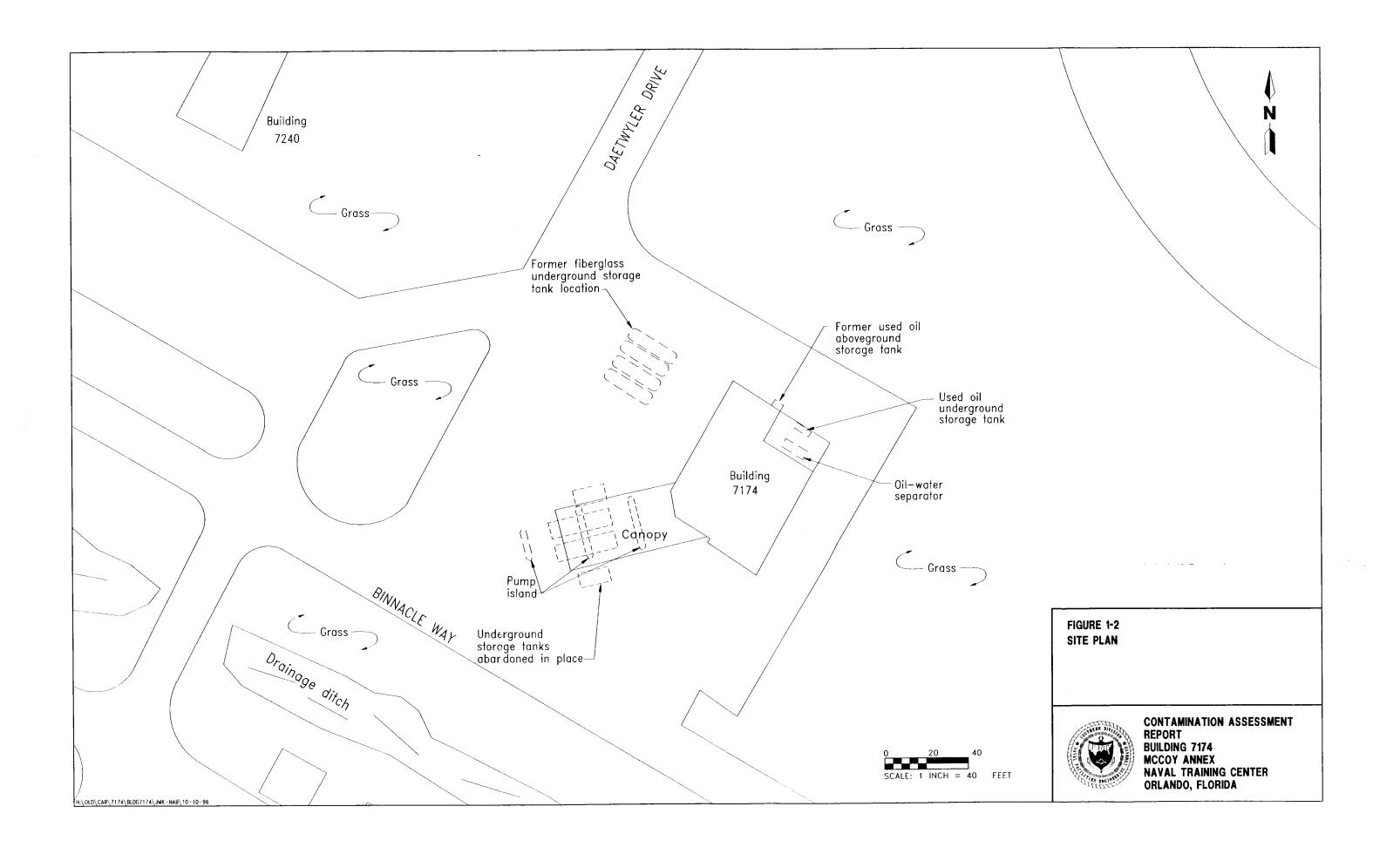
In late June 1991, ABB Environmental Services, Inc. (ABB-ES), personnel conducted a CA at the site. During the CA, eight additional 2-inch diameter shallow monitoring wells (Old-7174-11 through Old-7174-16, Old-7174-18 and Old-7174-19) and one 4 inch diameter monitoring well (Old-7174-7) were installed. Groundwater samples were collected by ABB-ES personnel and analyzed by Savannah Laboratories and Environmental Services, Inc. A groundwater elevation survey was completed and aquifer slug tests for hydraulic conductivity were performed.

Also, organic vapor analyzer (OVA) readings were taken on October 11, 1991, on soil samples that were collected during the CA. OVA readings confirmed that soil contamination exists at the site.

Based on the results of the CA investigation, ABB-ES recommended a remedial action plan (RAP) be prepared for the site.

In April 1993, ABB-ES prepared the RAP (ABB-ES, 1993) for the site, and in May 1993, OHM Remediation Services Corporation (OHM) prepared an RAP Addendum (OHM, 1993); both reports presented a cleanup plan for removing the petroleum contamination at the site. The groundwater contamination would be reduced by the installation of a pump-and-treat system that includes the installation of four recovery wells and the installation of an air stripper to remove volatile organic





compounds from the contaminated water. The level of soil contamination would be reduced by means of vapor extraction using a vacuum pump and treated by a carbon adsorption system. These systems would be operated until the petroleum-related contamination in both the groundwater and the soil would reach the required State target cleanup levels.

On July 6 and 7, 1994, a meeting was held at NTC, Orlando with Southern Division, Naval Facilities Engineering Command, the Activity, ABB-ES, and the remedial action contractor (Bechtel Environmental, Inc. (BEI). One result of the meeting was a plan to remove the four 10,000-gallon USTs, which were installed in 1986. From December 27, 1994, to January 3, 1995, the four tanks were excavated and removed from subsurface. Approximately 257.89 cubic yards of excessively contaminated soil were removed from the excavation for offsite thermal treatment. During the tank removal, monitoring wells Old-7174-1 through Old 7174-4 were destroyed. The excavation was filled to grade with clean fill.

In January 1995, ABB-ES investigated disposal options for effluent generated during remedial actions. The second RAP Addendum (ABB-ES, 1995) presented a plan for effluent disposal via storm-sewer system using a National Pollutant Discharge Elimination System permit. Other modifications include monitoring plan modifications and a size change for lead filtration.

Minor modifications, which included moving recovery well location, were incorporated into the planned groundwater recovery system to account for a slight increase in groundwater contaminant concentration and areal extent (ABB-ES, 1995a). Following these modifications it was determined that the soil vapor extraction (SVE) system would also be affected by the repositioning of the groundwater recovery wells. This also called into question the extent of the soil contamination, which was last investigated on October 10, 1991. ABB-ES mobilized on May 2, 1995, to conduct confirmatory sampling of soil southeast of the groundwater contaminant plume, an area in which groundwater remedial modifications had greatest impact on the SVE system. Six soil borings were advanced with samples collected and OVA headspace readings were taken, confirming that the reported soil contaminant concentrations had increased. ABB-ES recommended further assessment of the soil contamination at the site.

On October 4 and 5, 1995, 35 additional soil borings were installed at the site to completely assess the horizontal and vertical extent of soil contamination. Since late June 1995, the plume has traveled farther to the south and east.

This contamination assessment report (CAR) summarizes the data gathered during the first CAR and the more recent CA activities conducted at Building 7174. General information such as regional physiography, geology, hydrogeology, investigative methodologies, and procedures are included in the McCoy Annex, Orlando CAR (ABB-ES, 1995c).

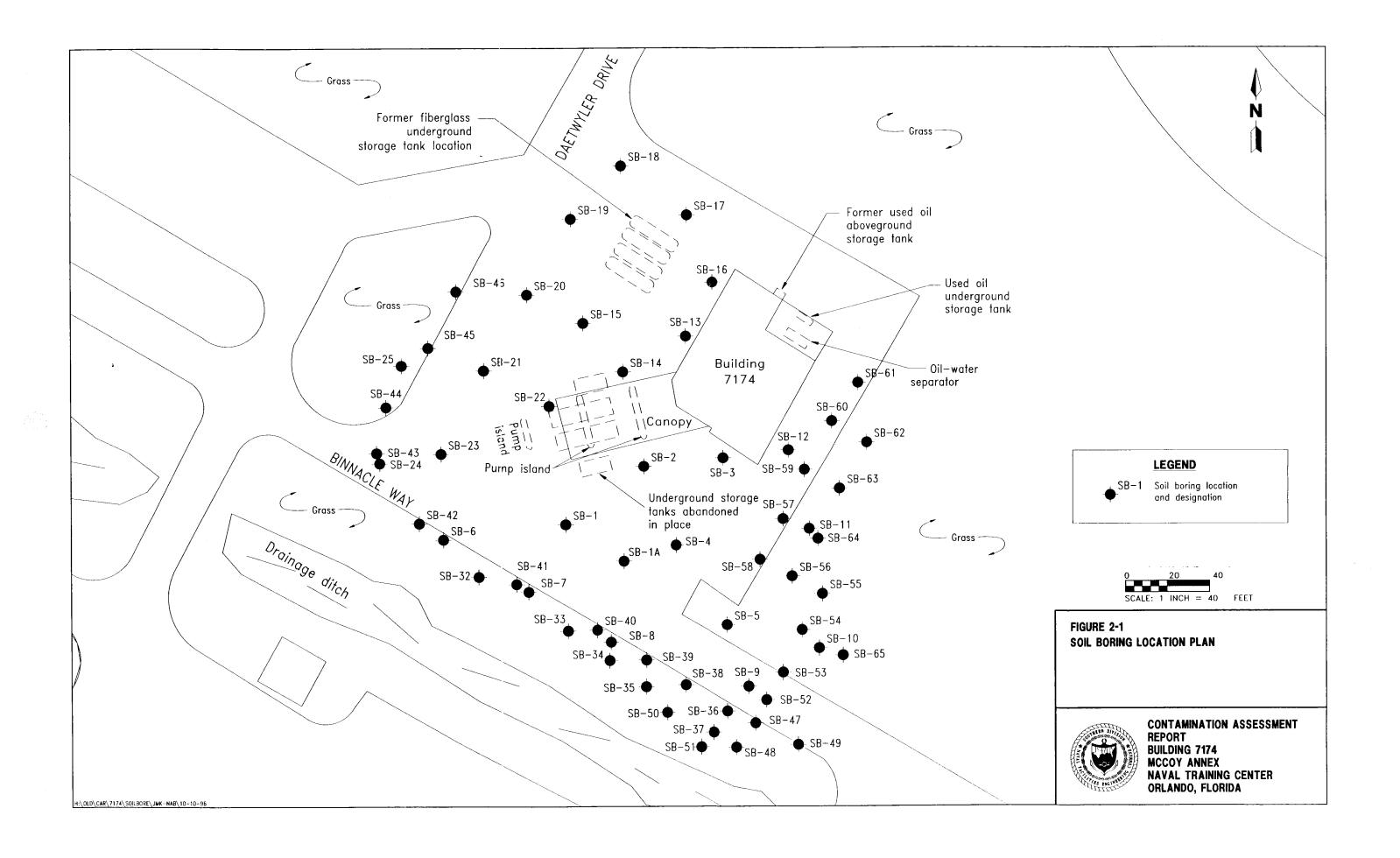
2.0 CONTAMINATION ASSESSMENT METHODOLOGY

2.1 SOIL BORING PROGRAM. Thirty-five soil borings were advanced using a vanmounted TerraProbe sampler on October 4 and 5, 1995, to determine if petroleum-contaminated soil was still onsite after the completion of tank removal activities and to supplement existing soil data. Figure 2-1 shows the locations of the soil borings. The borings were completed into the water table, which was encountered at approximately 5 to 7 feet below land surface (bls).

A total of 70 soil samples was collected from the 35 soil borings. The soil samples were collected at 1 to 3 feet and 3 to 5 feet bls. Headspace organic vapor concentrations were measured for all soil samples by placing each soil sample in a 16-ounce glass jar and using a calibrated, Foxboro 128 OVA equipped with a flame ionization detector following procedures outlined in Chapter 62-770, Florida Administrative Code (FAC). Carbon filters are utilized to differentiate total hydrocarbon response from naturally occurring methane gas. Filtered and unfiltered readings are obtained from a single jar. All sampling and analysis is performed in accordance with ABB-ES's FDEP-approved Comprehensive Quality Assurance Plan.

2.2 MONITORING WELL INSTALLATION PROGRAM. A total of 14 monitoring wells (OLD-7174-5 through OLD-7174-19) has been installed during the PCA in 1988 and the CAR in 1991. In addition, four shallow monitoring wells (Old-7174-20 through Old-7174-23) were installed at the site on July 12, 1996. Monitoring well OLD-7174-10 was destroyed by a lawnmower and later abandoned. The wells were installed using hollow-stem auger techniques to a depth of approximately 14 feet bls. A typical monitoring well construction detail is provided on Figure 2-2. Each well was constructed with 10 feet of 2-inch diameter 0.010-inch slotted well screen coupled to 4 feet of 2-inch schedule 40 solid polyvinyl chloride (PVC). assembly is placed in the borehole so that the screen interval is located at a depth that encompasses seasonal water table fluctuations. The annular space between the screen and the borehole is filled with 20/30-grade silica sand to 1 foot above the screened interval. A 1 foot fine sand (30/65-grade) seal is placed on top of the filter pack. The remaining annular space is sealed to grade with neat cement grout mixture. The deep monitoring well (OLD7174-17) installed in June of 1991 was constructed as a single case well, with 5 feet of 4-inch case diameter 0.010-inch slotted well screen coupled to 31 feet of 4-inch schedule 40 solid PVC. The annular space between the screen and the borehole was filled with 20/30-grade silica sand to approximately 1-foot above the screen. A 1- to 2-foot bentonite seal was then placed on top of the filter pack. The remaining annular space was grouted to surface with a neat cement grout (ABB-ES, 1991). A summary of the well construction details is presented in Table 2-1, and the well completion logs provided by the drilling subcontractor are included in Appendix C, Well Construction Details.

All monitoring wells were completed flush-mount with surface grade well vaults, and locking well caps were installed to conform with standards outlined in 40C-3, FAC. Each monitoring well was developed by overpumping until clear and free of sediment. Thorough field decontamination procedures were strictly enforced to prevent possible cross-contamination between field monitoring points. All drilling equipment, including drilling rods, bits, and hollow-stem augers, was thoroughly decontaminated between each well installation.



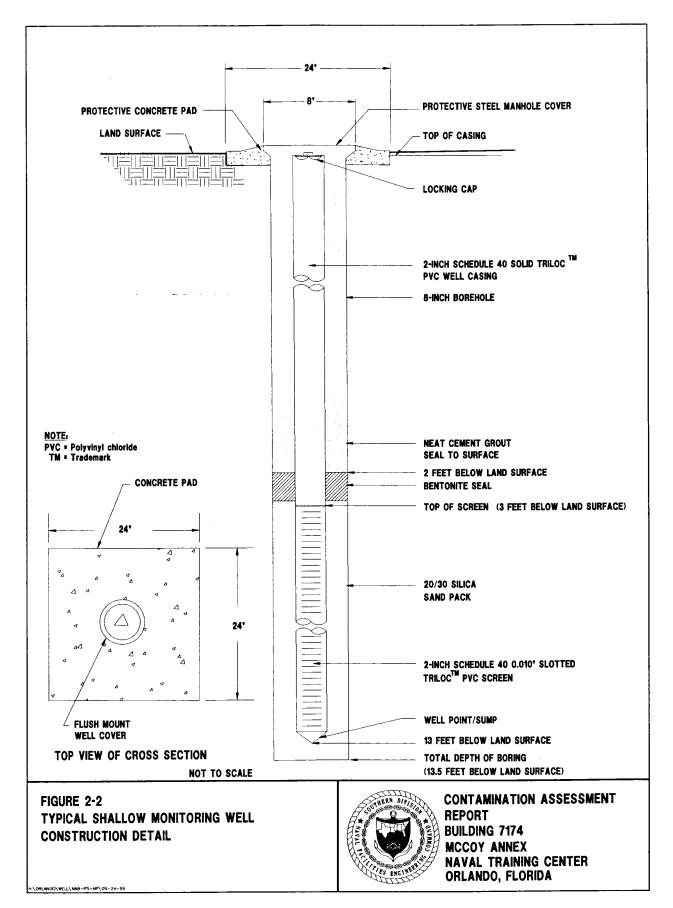


Table 2-1 Groundwater Monitoring Well Construction Data Summary

Contamination Assessment Report Building 7174 McCoy Annex, Exchange Service Station Naval Training Center Orlando, Florida

				Onando, i loi		
Well Number	Date Installed	Total Depth (feet bls)	Well Diameter (inches)	Screened Interval (feet bls)	Slot Size (inches)	Comments
7174-1	Unknown	Unknown	Unknown	Unknown	Unknown	Destroyed during tank removal.
7174-2	Unknown	Unknown	Unknown	Unknown	Unknown	Destroyed during tank removal.
7174-3	Unknown	Unknown	Unknown	Unknown	Unknown	Destroyed during tank removal.
7174-4	Unknown	Unknown	Unknown	Unknown	Unknown	Destroyed during tank removal.
7174-5	8/22/88	13.5	2	3.5-13.5	0.01	Installed by Groundwater Protection, In-
7174-6	8/22/88	15	2	5-15	0.01	Installed by Groundwater Protection, In-
7174-7	8/23/88	13	2	3-13	0.01	Installed by Groundwater Protection, In
7174-8	8/23/88	13	2	3-13	0.01	Installed by Groundwater Protection, In
7174-9	8/23/88	13	2	3-13	0.01	Installed by Groundwater Protection, In
7174-10	8/23/88	14	2	4-14	0.01	Destroyed and/or Abandoned.
7174-11	8/18/91	13	2	3-13	0.01	Installed by Groundwater Protection, In
7174-12	8/18/91	13	2	3-13	0.01	Installed by Groundwater Protection, In
7174-13	8/18/91	13	2	3-13	0.01	Installed by Groundwater Protection, In
7174-14	8/18/91	13	2	3-13	0.01	Installed by Groundwater Protection, In
7174-15	8/18/91	15	2	5-15	0.01	Installed by Groundwater Protection, In
7174-16	8/18/91	15	2	5-15	0.01	Installed by Groundwater Protection, In
7174-17	8/19/91	37	4	31-36	0.01	Installed by Groundwater Protection, In
7174-18	8/18/91	13	2	3-13	0.01	Installed by Groundwater Protection, In
7174-19	8/19/91	14	2	4-14	0.01	Installed by Groundwater Protection, In
7174-20	7/12/96	14	2	4-14	0.01	Installed by Groundwater Protection, In
7174-21	7/12/96	14	2	4-14	0.01	Installed by Groundwater Protection, In
7174-22	7/12/96	14	2	4-14	0.01	Installed by Groundwater Protection, In
7174-23	7/12/96	14	2	4-14	0.01	Installed by Groundwater Protection, In

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- 2.3 GROUNDWATER SAMPLING PROGRAM. Groundwater samples were collected from monitoring wells Old-7174-5 through Old-7174-23, except for OLD-7174-10, on July 22 and 23, 1996. These samples were packed on ice and transported to Quality Analytical Laboratories, Inc., in Montgomery, Alabama, for analysis. The groundwater samples were analyzed for the sampling requirements established in Chapter 62-770, FAC. Sites with gasoline and diesel discharges are defined under the Kerosene Analytical Group (KAG), which includes the following U.S. Environmental Protection Agency (USEPA) Methods: 504 (ethylene dibromide), 601 (volatile halocarbons), 602 (volatile organic aromatics [VOAs]), 610 (polynuclear aromatic hydrocarbons [PAHs], 418.1 (total petroleum hydrocarbons), and 239.2 (total lead).
- 2.4 GROUNDWATER ELEVATION SURVEY. The elevation and slope of the water table was calculated using the field-surveyed top-of-well casing data for each monitoring well and correlating the elevation data to a common datum. On May 23, July 22, and August 16, 1996, depth to groundwater was measured with an electronic water-level indicator from the top of casing (TOC) to the nearest hundredth of a foot in each of the monitoring wells. The groundwater depths were subtracted from the TOC elevation to obtain relative water table elevations. The wells were checked for the presence of free product by visual inspection of groundwater samples taken from each well and the use of an oil-water interface probe.

3.0 GEOLOGY AND HYDROGEOLOGY

- 3.1 SITE STRATIGRAPHY. For purposes of this investigation, site stratigraphy and aquifer evaluations were limited to the surficial aquifer beneath the site. The soil profile for the Building 7174 site is based on visual examination of soil samples collected from soil borings and drill cuttings obtained during the investigation. A typical stratigraphic soil profile consists of gray to brown mixture of fine-to-medium-grained sand with small amounts of silts down to a depth of 37 feet bls. Lithologic logs for soil borings and monitoring wells installed during this investigation are included as Appendix D, Lithologic Logs.
- 3.2 SITE HYDROGEOLOGY AND GROUNDWATER FLOW DIRECTION. Groundwater elevations across the site were calculated by measuring water levels on May 23, July 22, and August 16, 1996, in the site's monitoring wells and by surveying the relative TOC elevations. The hydraulic gradient across the site was calculated by measuring the change in elevation head between monitoring wells Old-7174-6 (upgradient well) and Old-7174-23 (downgradient well) and dividing this head difference by the horizontal distance between these two wells. The scaled horizontal distance is 260 feet, and the change in elevation head between the wells, as measured on August 16, 1996, was 3.27 feet. The calculated hydraulic gradient is equal to 1.25×10^{-2} feet per foot (ft/ft). The site groundwater flow direction, based on the water table surface map, is generally from north to south. The drainage ditch (located on the south side of Binnacle Way) has influence in the groundwater flow of the site, giving it a northwest to southeast component. Table 3-1 is a summary of groundwater elevation data for the May 23, July 22, and August 16, 1996 sampling events. Figures 3-1, 3-2, and 3-3 are the water table contour maps for May 23, July 22, and August 16, 1996, respectively.
- 3.3 AQUIFER CHARACTERISTICS. During the original Contamination Assessment Report (ABB-ES, 1991), aquifer characteristics were calculated from a series of slug tests, which were performed on monitoring wells 01d-7174-16, 01d-7174-18, and 01d-7174-19. The data were calculated using the computer program AQTESOLV and were based on the analytical method presented by Bouwer and Rice for partially penetrating wells screened in an unconfined aquifer. The program derives a hydraulic conductivity (K) value based on linear regression of the data gathered during the slug test. The results of the slug tests indicated an average horizontal hydraulic conductivity value between 1.29 feet per day (ft/day) and 3.85 ft/day. Estimates for the velocity of groundwater flow were obtained using the following formula:

$$V = K*I/n \tag{1}$$

where:

V = velocity of groundwater flow in ft/day,

K = hydraulic conductivity in ft/day,

I = hydraulic gradient ft/ft, and

n = estimated porosity in percent.

Table 3-1 Groundwater Elevation Summary

Contamination Assessment Report
Building 7174 McCoy Annex, Exchange Service Station
Naval Training Center
Orlando, Florida

Vell Number	Date	Depth to Product (ft btoc)	Depth to Water (ft btoc)	Product Thickness (feet)	Top-of-Casing Elevation (feet)	Water-Leve Elevation (feet)
MW-5	5/23/96		6.26		97.58	91.32
	7/22/96		4.90			92.68
	8/16/96		4.26			93.32
MW-6	5/23/96		8.52		100.00	91.48
	7/22/96		7.20			92.80
	8/16/96		6.28			93.72
MW-7	5/23/96		6.66		97.66	91.00
	7/22/96		5.44			92.22
	8/16/96		4.96			92.70
MW-8	5/23/96		6.31		97.68	91.37
	7/22/96		4.78			92.90
	8/16/96		4.08			93.60
MW-9	5/23/96		6.26		98.06	91.80
	7/22/96		4.92			93.14
	8/16/96		4.18			93.88
MW-11	5/23/96		7.24		97.32	90.08
	7/22/96	5.00	5.16	0.16		92.28
	8/16/96	4.28	4.51	0.23		92.98
	9/10/96	3.30	3.51	0.21		93.97
MW-12	5/23/96		6.80		96.99	90.19
	7/22/96		5.71			91.28
	8/16/96		5.12			91.87
MW-13	5/23/96		8.30		97.39	89.09
	7/22/96		7.59			89.80
	8/16/96		7.09			90.30
MW-14	5/23/96		7.94		97.30	89.36
	7/22/96		7.29			90.01
	8/16/96		6.75			90.55
MW-15	5/23/96		6.08		97.30	91.22
	7/22/96		4.73			92.57
	8/16/96		4.08			93.22
MW-16	5/23/96		7.18		97.44	90.26
	7/22/96		6.09			91.35
	8/16/96		5.31			92.13
MW-17	5/23/96		6.84		97.34	90.50
	7/22/96		5.65			91.69
	8/16/96		5.01			92.33
MW-18	5/23/96		7.71		97.08	89.37
	7/22/96		7.12			89.96
	8/16/96		6.76			90.32
MW-19	5/23/96		4.61		95.70	91.09
	7/22/96		3.32			92.38
	8/16/96		2.56			93.14

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Table 3-1 (Continued) Groundwater Elevation Summary

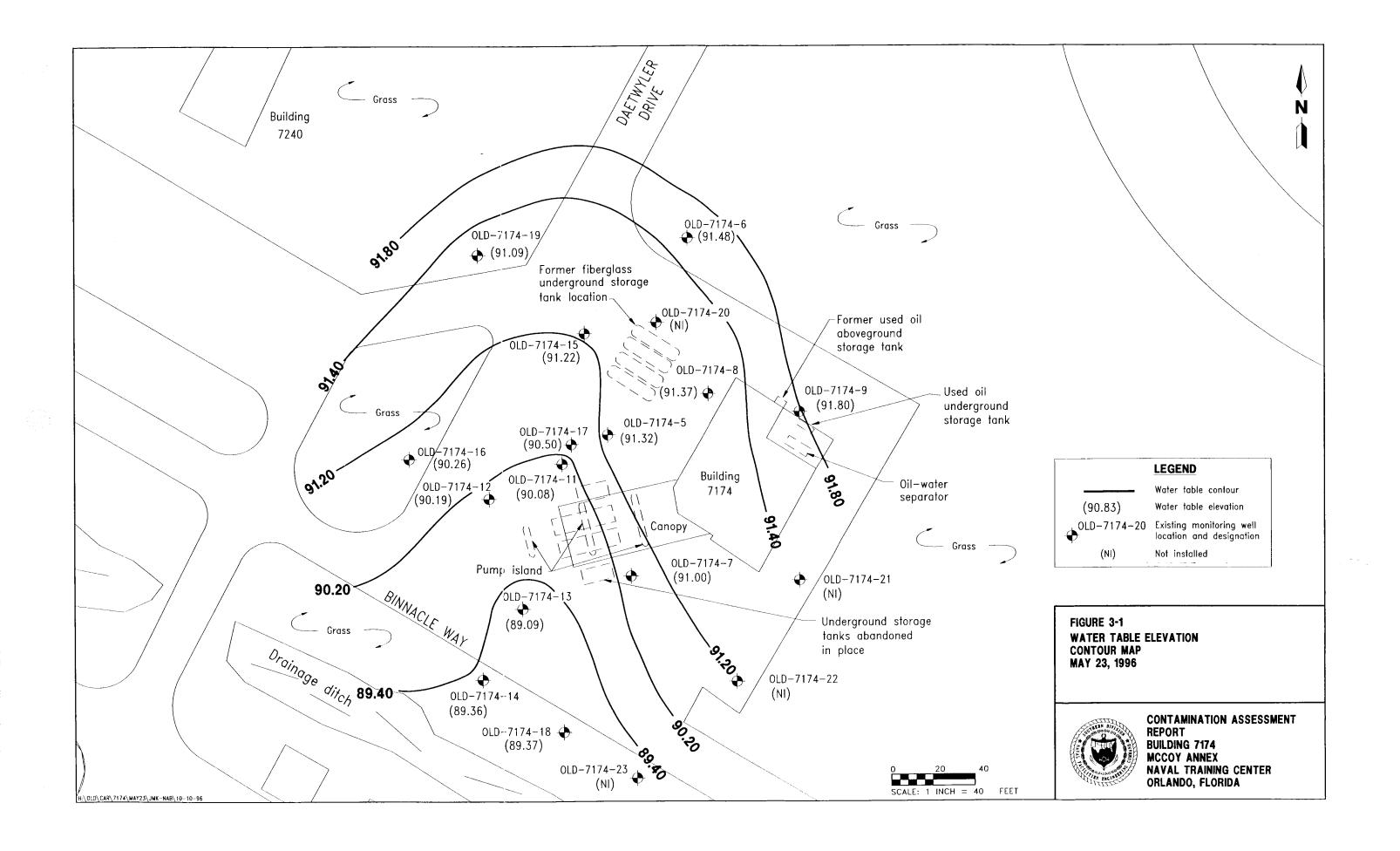
Contamination Assessment Report
Building 7174 McCoy Annex, Exchange Service Station
Naval Training Center
Orlando, Florida

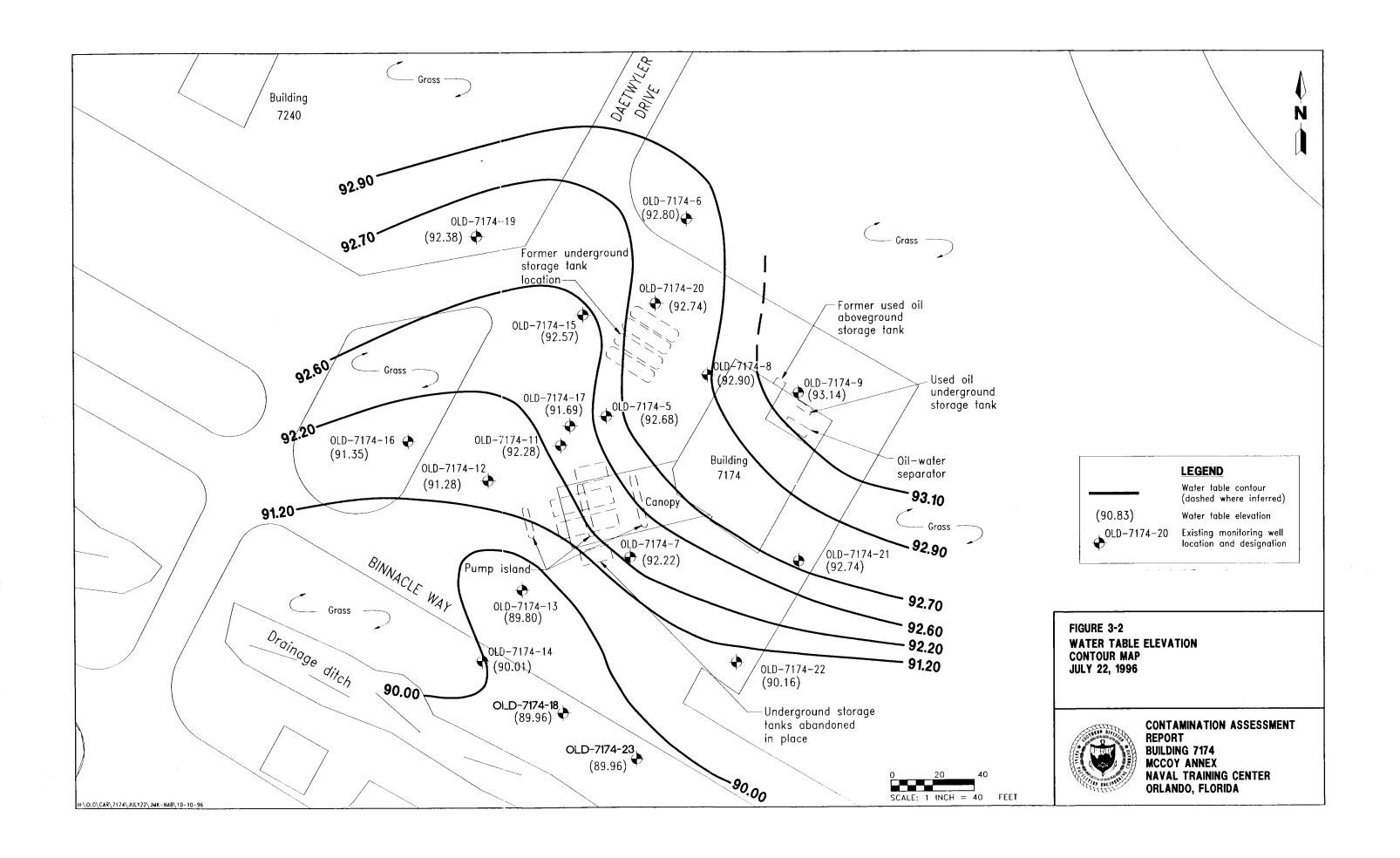
Well Number	Date	Depth to Product (ft btoc)	Depth to Water (ft btoc)	Product Thickness (feet)	Top-of-Casing Elevation (feet)	Water-Level Elevation (feet)
MW-20	5/23/96 7/22/96 8/16/96		NI 4.79 4.03		97.53	 92.74 93.50
MW-21	5/23/96 7/22/96 8/16/96		NI 4.68 3.82		97.42	 92.74 93.60
MW-22	5/23/96 7/22/96 8/16/96		NI 6.51 5.84		96.67	90.16 90.83
MW-23	5/23/96 7/22/96 8/16/96		NI 7.21 6.72		97.17	 89.96 90.45
PZ-1	5/23/96 7/22/96 8/16/96 9/10/96		NI 7.30 6.55 5.57		99.56	92.26 93.01 93.99
PZ-2	5/23/96 7/22/96 8/16/96 9/10/96		NI 5.55 4.79 4.05		97.85	92.30 93.06 93.80
PZ-3	5/23/96 7/22/96 8/16/96 9/10/96	6.03 5.29 4.57	NI 8.01 7.49 6.27	1.98 2.20 1.70	98.95	92.43 93.11 93.96
PZ-4	5/23/96 7/22/96 8/16/96 9/10/96		NI 7.38 6.62 5.61		99.70	92.32 93.08 94.09
PZ-5	9/10/96	5.52	5.63	0.11	99.79	94.24
PZ-6	9/10/96	4.90	5.68	0.78	99.23	94.14
PZ-7	9/10/96		4.70		98.80	94.10
PZ-8	9/10/96		4.78		98.96	94.18
PZ-9	9/10/96		5.38		99.70	94.32

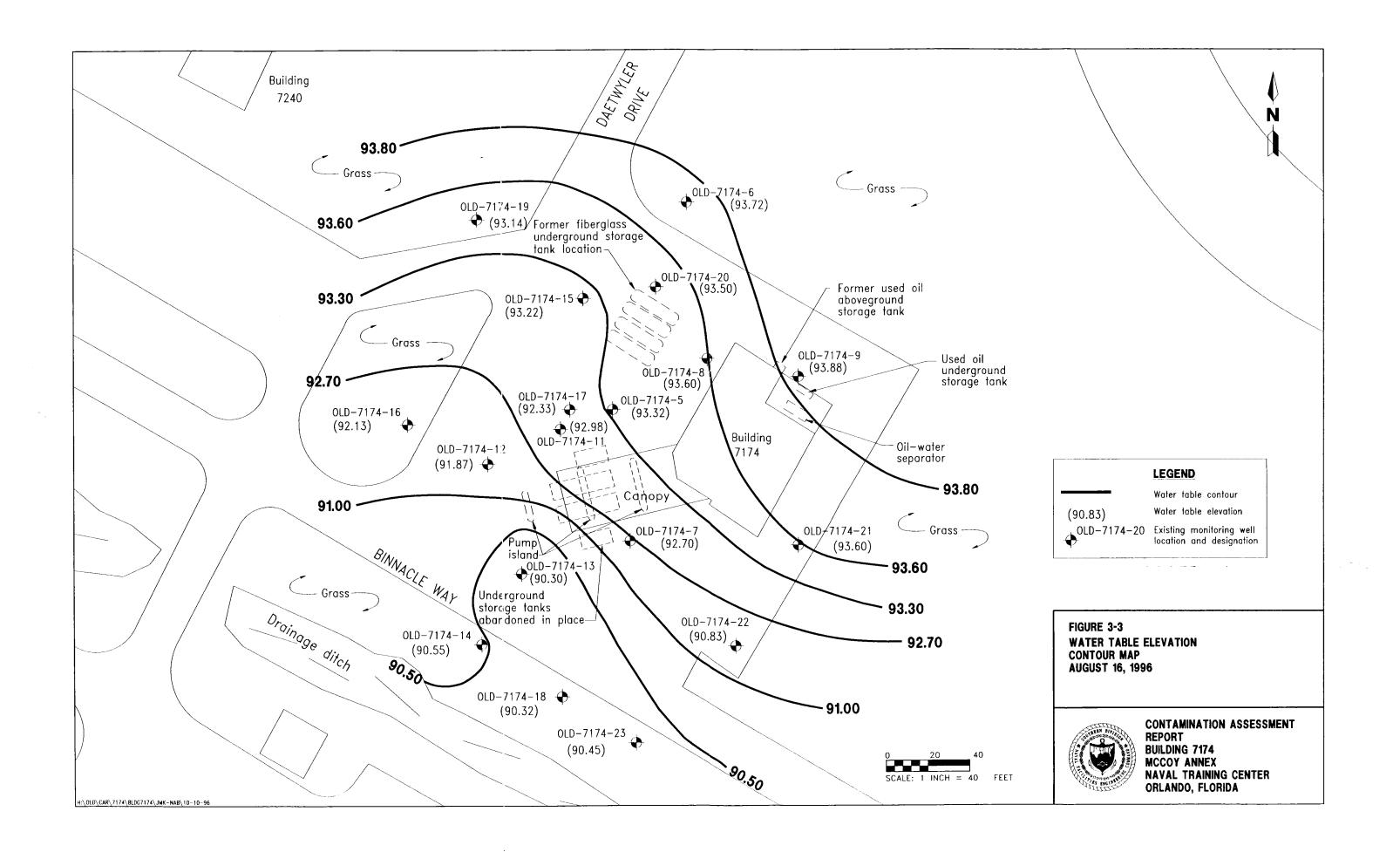
Notes: ft btoc = feet below top of casing.

NI = not installed.

-- = not available.







Assuming an porosity of 25 percent and a calculated hydraulic gradient of 0.0125, the calculated average groundwater flow velocity would be as follows:

$$V = (2.57 * 0.0125) / 0.25$$

 $V = 0.1285 \text{ ft/day} = 46.9 \text{ ft/year}$

In order to calculate a transmissivity value from the slug test results, the following formula was used:

$$T = K * b \tag{2}$$

where:

 $T = transmissivity in square-foot per day (ft^2/day)$

K = hydraulic conductivity in ft/day, and

b = saturated thickness of aquifer in feet.

Based on the formula, the calculation for T would be as follows:

T = 2.57 * 41

 $T = 105.37 \text{ ft}^2/\text{day}$

Appendix E contains copies of the computer generated graphical representation of the slug test results for wells tested during the original contamination assessment.

- 3.4 POTABLE WELL SURVEY. The CAR (ABB-ES, 1991) reported that no drinking water wells were found within a 1-mile radius around the site. A more recent potable well survey for the surrounding area is included in the McCoy Annex CAR (ABB-ES, 1995). No active potable well are reported in the site vicinity, although five potable wells (MW-1 through MW-5) which are not in use are located within a 0.25 mile radius of the site. See Figure 5-1 of the McCoy Annex CAR (ABB-ES, 1995).
- 3.5 SURFACE WATER. The surface water body nearest to the site is Lake Conway, which is approximately 4,000 feet north of the site. In addition, several drainage ditches and canals are located within 200 feet east and south of the site vicinity.

4.0 CONTAMINATION ASSESSMENT RESULTS

4.1 SOIL CONTAMINATION. Thirteen soil borings (SB-1 through SB-13) were performed following the original CAR and were completed during the preparation of the RAP (ABB-ES, 1993). Additional soil borings (SB95-1 through SB95-31) were performed as a part of the second Remedial Action Addendum (ABB-ES, 1995). Copies of the tables summary of the OVA data are included in Appendix B. In order to complete the soil assessment for the site, an additional 33 soil borings (SB-32 through SB-65) were advanced using van-mounted TerraProbeSM sampler on October 4 and 5, 1995. Figure 2-1 shows all of the soil boring locations. A total of 110 soil samples was collected at discrete intervals for OVA analysis. A summary of OVA analyses conducted on October 4 and 5, 1995, is presented in Table 4-1.

An estimated 5,026 cubic yards of contaminated soil was identified and located in the southeast area of the site. Figure 4-1 shows the soil boring location.

- 4.2 FREE-PRODUCT OCCURRENCE. Due to the presence of free product at Old-7174-11, in early 1996 four piezometers (PZ-1 through PZ-4) were installed north, east, south and west of Old-7174-11 on June 6, 1996. On August 6, 1996, ABB-ES measured 1.27 feet of free product at PZ-3 and 0.19 foot at Old-7174-11. On August 13, 1996, the free-product levels increased to 1.99 at PZ-3 and to 0.2 foot at Old-7174-11. Therefore, three additional piezometers were installed (PZ-5 through PZ-7) upgradient to PZ-3. ABB-ES measured 0.11 foot of free product at PZ-5 and 0.78 foot at PZ-7. On September 7, 1996, two additional piezometers (PZ-8 and PZ-9) were installed in an attempt to define the extent of the free-floating product onsite. The horizontal extent of the free product is shown on Figure 4-2.
- 4.3 GROUNDWATER CONTAMINATION. During the original CA investigation, groundwater samples were taken from monitoring wells Old-7174-1 through Old-7174-10 on August 25, 1988. Nine additional monitoring wells were installed (Old-7174-11 through Old-7174-19) and a complete round of samples were collected for analyses on June 6, 1991. On March 12, 1992, during the remedial action activities, samples were taken from Old-7174-1 through Old-7174-8 and Old-7174-19. On November 5, 1995, in preparing the first remedial action addendum, additional samples were taken from Old-7174-1 through Old-7174-8 and Old-7174-12 through Old-7174-19. On September 8, 1995, during the preparation of the second RAP addendum, additional samples were taken from Old-7174-1 through Old-7174-8 and Old-7174-12 through Old-7174-19. After the tank removal activities, additional samples were taken on April 18, 1995, from Old-7174-5 through Old-7174-9 and Old-7174-12 through Old-7174-19. A summary of the above laboratory analytical results are summarized in Table 4-2.

Four additional shallow monitoring wells (Old-7174-20 through Old-7174-23) were installed at the site on July 12, 1996, and sampled on July 23, 1996. These wells were installed downgradient from the area of known for petroleum contamination to delineate the horizontal extent of hydrocarbon contamination and to assess the groundwater flow direction. Monitoring well locations are shown on Figure 4-3.

Table 4-1 (Continued) Summary of Organic Vapor Analyses, October 4 and 5, 1995

Contamination Assessment Report
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Hand Auger Soil Boring No.	Depth (feet)	Unfiltered (ppm)	Filtered (ppm)	Total Hydrocarbons (ppm)	Comments
SB-42	1-3	<1	<1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.
	3-5	<1	<1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.
SB-43	1-3	18	<1	18	Well-sorted, fine-grained, brown, silty sand; no odor.
	3-5	28	<1	28	Well-sorted, fine-grained, brown, silty sand; no odor.
SB-44	1-3	< 1	<1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.
	3-5	<1	<1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.
SB-45	1-3	<1	<1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.
	3-5	<1	< 1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.
SB-46	1-3	< 1	<1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.
	3-5	<1	<1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.
SB-47	1-3	5	<1	5	Well-sorted, fine-grained, brown, silty sand; no odor.
	3-5	800	25	775	Well-sorted, fine-grained, brown, silty sand; no odor.
SB-48	1-3	< 1	<1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.
	3-5	2	<1	2	Well-sorted, fine-grained, brown, silty sand; no odor.
SB-49	1-3	< 1	<1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.
	3-5	< 1	<1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.
SB-50	1-3	<1	<1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.
	3-5	12	<1	12	Well-sorted, fine-grained, brown, silty sand; no odor.
SB-51	1-3	< 1	<1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.
	3-5	<1	<1	<1	Well-sorted, fine-grained, brown, silty sand; no odor.

NTC-7174.CAR ASW.10.96

Table 4-1 (Continued) Summary of Organic Vapor Analyses, October 4 and 5, 1995

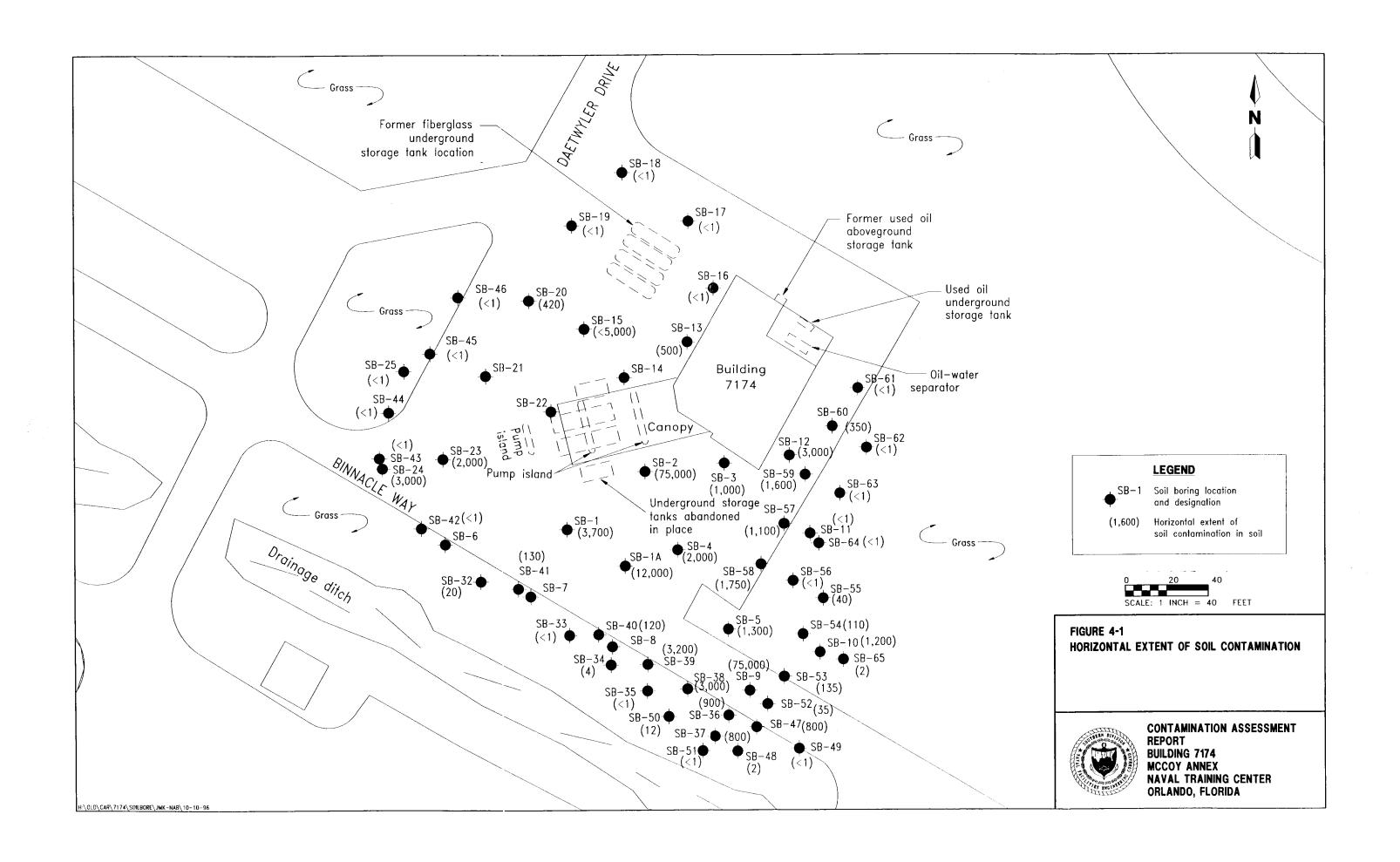
Contamination Assessment Report
Building 7174 McCoy Annex, Exchange Service Station
Naval Training Center
Orlando, Florida

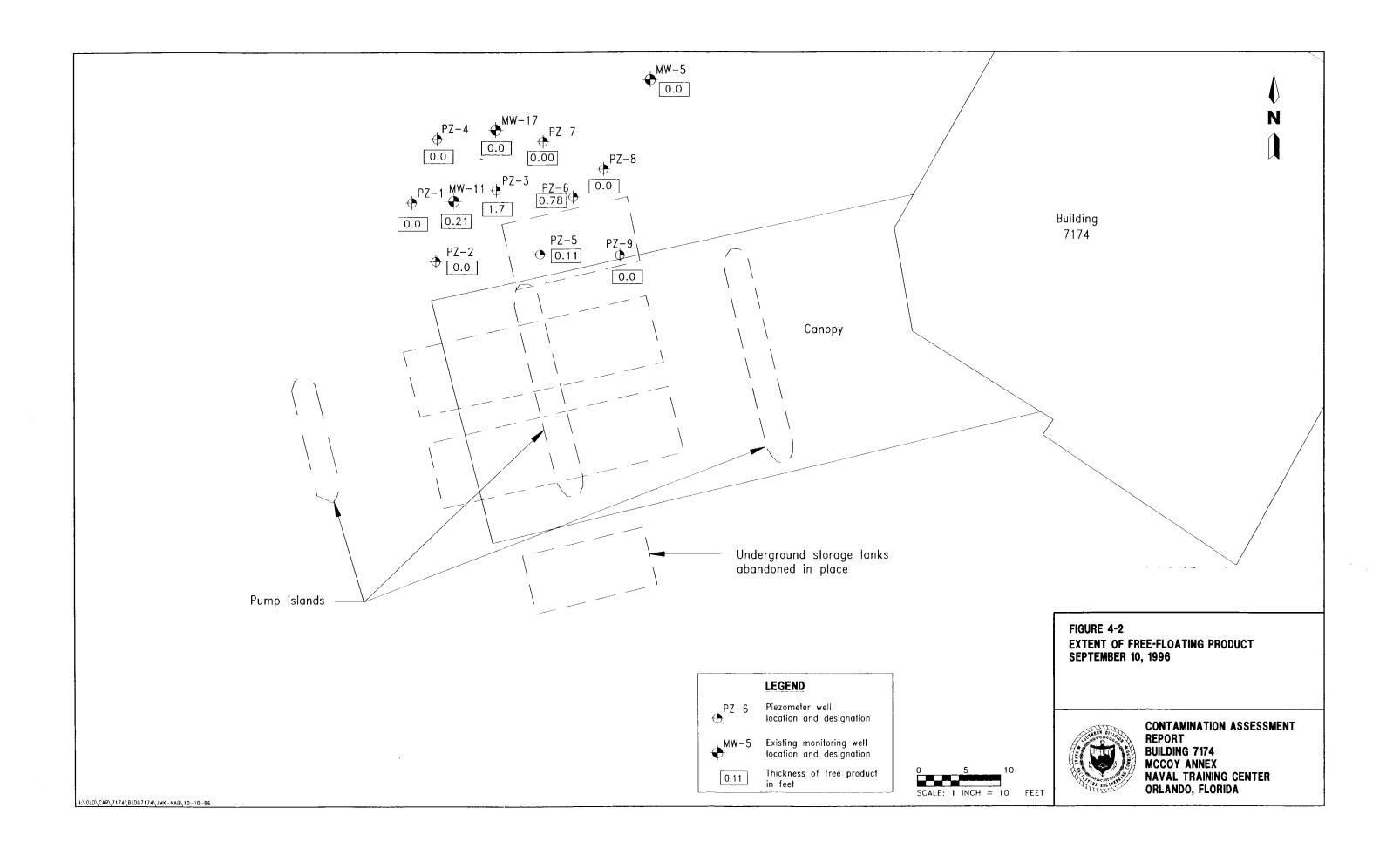
Hand Auger Soil Boring No.	Depth (feet)	•		Total Hydrocarbons (ppm)	Comments
SB-62	1-3	<1	<1	<1	Well-sorted, fine-grained, brown, silty, fine sand; no odor.
	3-5	< 1	<1	<1	Well-sorted, fine-grained, brown, silty, fine sand; no odor.
SB-63	1-3	< 1	<1	<1	Well-sorted, fine-grained, brown, silty, fine sand; no odor.
	3-5	< 1	<1	<1	Well-sorted, fine-grained, brown, silty, fine sand; no odor.
SB-64	1-3	<1	<1	<1	Well-sorted, fine-grained, brown, silty, fine sand; no odor.
	3-5	<1	<1	<1	Well-sorted, fine-grained, brown, silty, fine sand; no odor.
SB-65	1-3	< 1	< 1	<1	Well-sorted, fine-grained, brown, silty, fine sand; no odor.
	3-5	2	<1	2	Well-sorted, fine-grained, brown, silty, fine sand; no odor.

Readings for unfiltered samples are total hydrocarbon readings including methane; readings for filtered samples are methane only.

Notes: ppm = parts per million.

<1 = nondetectable limit for PortaFID IIM.





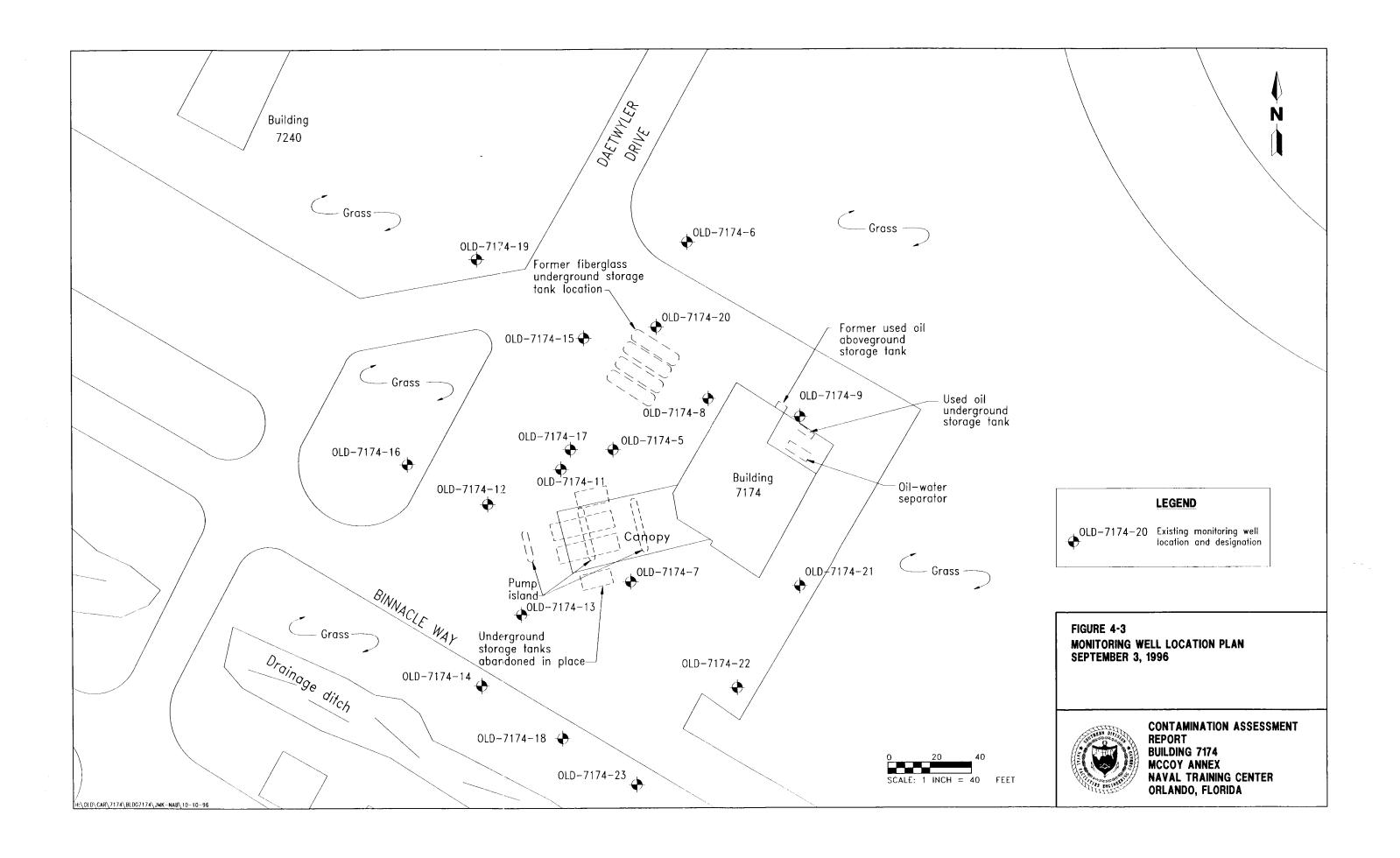


Table 4-2 Summary of Groundwater Laboratory Results

	Chapter 62-770		Mo	onitoring Well Num	ber	
Parameter	FAC Target Cleanup Levels	Old-7174-1 08/25/88	Old-7174-2 08/25/88	Old-7174-3 08/25/88	Old-7174-4 08/25/88	Old-7174-5 08/25/88
Benzene	1	13	6000	3	2	130
Ethylbenzene	NA	4	200	BDL	BDL	2
Toluene	NA	6	2,800	BDL	BDL	17
Xylenes	NA	10	1,500	BDL	BDL	8
Total VOAs	50	33	10,500	3	2	157
MTBE	50	NS	NS	NS	NS	220
EDB	0.02	NS	NS	NS	NS	BDL
Total Lead	50	NS	NS	NS	NS	3
TRPH	5	NS	NS	NS	NS	BDL
Naphthalene (Total)	100	NS	NS	NS	NS	NS

	Chapter 62-770	Monitoring Well Number									
Parameter	FAC Target Cleanup Levels	Old-7174-6 08/25/88	Old-7174-7 08/25/88	Old-7174-8 08/25/88	Old-7174-9 08/25/88	Old-7174-10 08/25/55					
Benzene	1	BDL	BDL	BDL	BDL	BDL					
Ethylbenzene	NA	BDL	BDL	BDL	BDL	BDL					
Toluene	NA	BDL	BDL	BDL	BDL	BDL					
Xylenes	NA	BDL	BDL	BDL	BDL	BDL					
Total VOAs	50	BDL	BDL	BDL	BDL	BDL					
MTBE	50	BDL	BDL	BDL	BDL	BDL					
EDB	0.02	BDL	BDL	BDL	BDL	BDL					
Total Lead	50	22	9	2	1	13					
TRPH	55	BDL	BDL	BDL	BDL	BDL					
Naphthalene (Total)	100	NS	NS	NS	NS	NS					

Table 4-2 (Continued) Summary of Groundwater Laboratory Results

	Chapter 62-770					Monitoring	Well Numbe	r		<u> </u>	<u></u>
Parameter	FAC Target Cleanup Levels	Old-7174-1	Old-7174-2 06/25/91	Old-7174-3 06/25/91	Old-7174-4 06/25/91	Old-7174-5 06/25/91	Old-7174-6 06/25/91	Old-7174-7 06/25/91	Old-7174-8 06/25/91	Old-7174-11 06/25/91	Old-7174-12 06/25/91
Benzene	1	490	4,000	BDL	BDL	190	BDL	9.5	BDL	4,300	BDL
Ethylbenzene	NA	130	450	BDL	BDL	40	BDL	1.3	BDL	1,100	BDL
Toluene	NA	6.9	34	BDL	BDL	8.1	BDL	3.4	BDL	9,800	BDL
Xylenes	NA	110	130	BDL	BDL	42	BDL	8.1	BDL	6,400	BDL
Total VOAs	50	736.9	4,614	BDL	BDL	280.1	BDL	22.3	BDL	21,600	BDL
MTBE	50	13,000	36,000	33	BDL	8,600	BDL	13	BDL	6,100	5,500
EDB	0.02	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1.4	BDL
Total Lead	50	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TRPH	5	5.7	13	BDL	BDL	1.1	BDL	BDL	BDL	BDL	BDL
Naphthalene (Total)	100	BDL	78	BDL	BDL	BDL	BDL	BDL	BDL	396	BDL
See notes at end of t	able.					<u> </u>					

Table 4-2 (Continued) Summary of Groundwater Laboratory Results

		Monitoring Well Number									
	Chapter 62-770				IVIC	initoring well N	umber				
Parameter	FAC Target Cleanup Levels	Old-7174-13 06/25/91	Old-7174-14 0625/91	Old-7174-15 06/25/91	Old-7174-16 06/25/91	Old-7174-17 06/25/91	Old-7174-18 06/25/91	Old-7174-19 06/25/91	Old-7174-3D 6/25/91	Old-7174-13D 06/25/91	
Benzene	1	220	BDL	1.8	BDL	BDL	BDL	BDL	BDL	17	
Ethylbenzene	NA	36	BDL	1.3	BDL	BDL	BDL	BDL	BDL	8.7	
Toluene	NA	260	BDL	1.1	BDL	BDL	BDL	BDL	BDL	40	
Xylenes	NA	350	BDL	BDL	BDL	2.2	BDL	BDL	BDL	53	
Total VOAs	50	866	BDL	4.2	BDL	2.2	BDL	BDL	BDL	118.7	
MTBE	50	270	BDL	420	BDL	BDL	BDL	BDL	23	30	
EDB	0.02	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Total Lead	50	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
TRPH	5	BDL	BDL	BDL	BDL	1.5	BDL	5	BDL	2.4	
Naphthalene (Total)	100	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
See notes at end of t	able.									 · ·	

Table 4-2 (Continued) Summary of Groundwater Laboratory Results

	Chapter 62-770				Monitoring	Well Number			
Parameter	FAC Target Cleanup Levels	Old-7174-1 03/12/92	Old-7174-2 03/12/92	Old-7174-3 03/12/92	Old-7174-4 03/12/92	Old-7174-5 03/12/92	Old-7174-6 03/12/92	Old-7174-7 03/12/92 2 ND ND 1 3	Old-7174-8 03/12/92
Benzene	1	12	190	2	ND	8	ND	2	ND
Ethylbenzene	NA	4	61	ND	ND	8	ND	ND	ND
Toluene	NA	ND	ND	ND	ND	ND .	ND	ND	ND
Xylenes	NA	5	16	ND	ND	4	ND	1	ND
Total VOAs	50	21	267	2	ND	20	ND	3	ND
MTBE	50	340	3,100	3	ND	1,000	ND	2	ND
EDB	0.02	0.07	ND	ND	ND	ND	ND	ND	ND
Total Lead	50	ND	ND	13	19	6	22	26	ND
TRPH	5	ND	2	ND	ND	ND	ND	ND	ND
Naphthalene (Total)	100	ND	223	ND	ND	ND	ND	ND	ND

	Chapter 62-770				Monitoring	Well Number			
Parameter	FAC Target Cleanup Levels	Old-7174-12 03/12/92	Old-7174-13 03/12/92	Old-7174-14 03/12/92	Old-7174-15 03/12/92	Old-7174-16 03/12/92	Old-7174-17 03/12/92	Old-7174-19 03/12/92 ND ND ND ND ND	Old-7174-19D 03/12/92
Benzene	1	5	109	ND	ND	ND	ND	ND	3
Ethylbenzene	NA	5	23	ND	ND	ND '	ND	ND	ND
Toluene	NA	ND	17	ND	ND	ND .	ND	ND	ND
Xylenes	NA	4	84	ND	ND	ND	ND	ND	1
Total VOAs	50	14	233	ND	ND	ND	ND	ND	4
MTBE	50	3,400	9	ND	150	18	ND	ND	ND
EDB	0.02	ND	ND	ND	ND	ND	ND	0.06	ND
Total Lead	50	110	17	160	19	190	ND	ND	19
TRPH	5	ND	ND						
Naphthalene (Total)	100	ND	ND	ND	ND	ND	ND	49	ND
See notes at end of ta	ble.								

Table 4-2 (Continued) Summary of Groundwater Laboratory Results

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	Chapter 62-770	Monitoring Well Number										
Parameter	FAC Target Cleanup Levels	Old-7174-1 11/5/92	Old-7174-2 11/5/92	Old-7174-3 11/5/92	Old-7174-4 11/5/92	Old-7174-5 11/5/92	Old-7174-6 11/5/92	Old-7174-7 11/5/92	Old-7174-8 11/5/92	Old-7174-9 11/5/92	Old-7174-10 11/5/92	
Benzene	1	320	620	BDL	BDL	164	BDL	BDL	BDL	NS	NS	
Ethylbenzene	NA	85	350	BDL	BDL	42.4	BDL	BDL	BDL	NS	NS	
Toluene	NA	BDL	17	BDL	BDL	7	BDL	BDL	BDL	NS	NS	
Xylenes	NA	10	85	BDL	BDL	66.6	BDL	BDL	BDL	NS	NS	
Total VOAs	50	415	1,072	BDL	BDL	280	BDL	BDL	BDL	NS	NS	
MTBE	50	680	4,720	36	BDL	1,066	BDL	BDL	BDL	NS	NS	
EDB	0.02	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	NS	NS	
Total Lead	50	BDL	6	9	14	13	59	14	18	NS	NS	
TRPH	5	1,300	2,800	BDL	BDL	BDL	BDL	BDL	BDL	NS	NS	
Naphthalene (Total)	100	BDL	13.5	BDL	BDL	BDL	BDL	BDL	BDL	NS	NS	

	<u> </u>	· -								
	Chapter 62-770				Mo	nitoring Well N	lumber			
Parameter	FAC Target Cleanup Levels	Old-7174-11 11/5/92	Old-7174-12 11/5/92	Old-7174-13 11/5/92	Old-7174-14 11/5/92	Old-7174-15 11/5/92	Old-7174-16 11/5/92	Old-7174-17 11/5/92	Old-7174-18 11/5/92	Old-7174-19 11/5/92
Benzene	1	NS	83	950	BDL	2.7	BDL	BDL	BDL	BDL
Ethylbenzene	NA	NS	12	170	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	NA	NS	BDL	1,030	4.2	BDL	BDL	BDL	BDL	BDL
Xylenes	NA	NS	BDL	950	5.1	BDL	BDL	BDL	BDL	BDL
Total VOAs	50	NS	95	3,100	9.3	2.7	BDL	BDL	BDL	BDL
мтве	50	NS	2,950	130	BDL	47	BDL	BDL	BDL	BDL
EDB	0.02	NS	BDL							
Total Lead	50	NS	160	105	160	8	120	41	82	53
TRPH	5	NS	BDL							
Naphthalene (Total)	100	NS	43	58	BDL	BDL	BDL	BDL	BDL	BDL
See notes at end of t	able.							· · · · · ·		

	Chapter 62-770					Monitoring	Well Number				
Parameter	FAC Target Cleanup Levels	Old-7174-1 09/8/94	Old-7174-1D 09/8/94	Old-7174-2 09/8/94	Old-7174-2D 09/8/94	Old-7174-3 09/8/94	Old-7174-4 09/8/94	Old-7174-5 09/8/94	Old-7174-6 09/8/94	Old-7174-7 09/8/94	Old-7174-8 09/5/94
Benzene	1	320	300	120	590	12	1.6	110	<1	6.6	2.1
Ethylbenzene	NA	49	46	22	100	6.8	<1	<1	<1	1.6	<1
Toluene	NA	51	48	2.4	11	1.4	<1	<1	<1	< 1	<1
Xylenes	NA	54	49	6.6	31	1.9	<1	<1	<1	5.7	< 1
Total VOAs	50	474	443	151	732	22.1	1.6	110	<1	13.9	2.1
MTBE	50	100	94	60	310	3.5	<1	220	<4	3.8	1.2
EDB	0.02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total Lead	50	7	6.2	18.2	21.2	7.4	6.3	24	26.1	19	17.4
TRPH	5	1.7	1.5	2.2	2.8	<1	<1	1	<1	<1	<1
Naphthalene (Total)	100	< 5	<5	258	264	<5	<5	<5	<5	<5	<5
See notes at end of t	able.			-	_		•				

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	Chapter 62-770		Monitoring Well Number										
Parameter	FAC Target Cleanup Levels	Old-7174-9 09/8/94	Old-7174-12 09/8/94	Old-7174-13 09/8/94	Old-7174-14 09/8/94	Old-7174-15 09/8/94	Old-7174-16 09/8/94	Old-7174-17 09/8/94	7 Old-7174-18 09/8/94 <1 <1 <1 <1 <1 <1	Old-7174-19 09/8/94			
Benzene	1	<1	29	430	<1	5.8	< 1	<1	<1	<1			
Ethylbenzene	NA	< 1	27	74	<1	<1	<1	<1	<1	<1			
Toluene	NA	<1	< 1	360	<1	<1	<1	<1	<1	<1			
Xylenes	NA	<1	3.3	810	<1	<1	<1	<1	<1	<1			
Total VOAs	50	<1	59.3	1,674	<1	5.8	<1	<1	<1	<1			
MTBE	50	<4	150	58	<4	7.7	<4	< 4	< 4	<4			
EDB	0.02	NS	NS	NS	NS	NS	NS	NS	NS	NS			
Total Lead	50	14	22.2	19.7	22.5	5.4	6.2	11.1	37.1	6.4			
TRPH	5	1.4	<1	<1	<1	<1	<1	<1	<1	<1			
Naphthalene (Total)	100	< 10	26	13	<5	< 5	<5	<5	<5	<5			

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Parameter	Chapter 62-770 FAC Target Cleanup Levels	Monitoring Well Number									
		Old-7174-5 04/18/95	Old-7174-6 04/18/95	Old-7174-7 04/18/95	Old-7174-8 04/18/95	Old-7174-9 04/18/95	Old-7174-12 04/18/95	Old-7174-13 04/18/95	Old-7174-14 04/18/95	Old-7174-15 04/18/95	Old-7174-16 04/18/95
Benzene	1	3,911J	<1	<1	<1	<1	120	53	<1	54	<1
Ethylbenzene	NA	< 5,000	<1	<1	<1	<1	21	9.2	<1	< 50	<1
Toluene	NA	8,500	<1	<1	<1	<1	14	38	< 1	< 50	<1
Xylenes	NA	<5,000	<1	<1	<1	<1	75	66	<1	< 50	< 1
Total VOAs	50	8,500	<4	<4	<4	<4	230	166.2	<4	54	<4
MTBE	50	31,000	< 1	<1	<1	<1	150	<2	< 1	260	< 1
EDB	0.02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total Lead	50	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
TRPH	5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Naphthalene (Total)	100	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Contamination Assessment Report Building 7174 McCoy Annex, Exchange Service Station Naval Training Center Orlando, Florida

	Chapter 62-770	Monitoring Well Number								
Parameter	FAC Target Cleanup Levels	Old-7174-17 04/18/95	Old-7174-18 04/18/95	Old-7174-19 04/18/95	Old-7174-5 07/23/96	Old-7174-5D 07/23/96	Old-7174-6 07/23/96			
Benzene	1	<1	<1	<1	130	120	<1			
Ethylbenzene	NA	< 1	<1	< 1	79	68	<1			
Toluene	NA	< 1	< 1	<1	15 ·	13	<1			
Xylenes	NA	< 1	<1	<1	48	43.7	<1			
Total VOAs	50	< 4	<4	<4	272	244.7	<4			
MTBE	50	< 1	1.5	<1	<1	<1	<1			
EDB	0.02	NS	NS	NS	< 0.02	< 0.02	< 0.02			
Total Lead	50	NS	NS	NS	21	17.9	43.4			
TRPH	5	NS	NS	NS	0.14	0.34	0.25			
Naphthalene (Total)	100	NS	NS	NS	28	33	<2			

Table 4-2 (Continued) Summary of Groundwater Laboratory Results

	Chapter 62-770 FAC Target Cleanup Levels	Monitoring Well Number									
Parameter		Old-7174-7 07/23/96	Old-7174-8 07/23/96	Old-7174-9 07/23/96	Old-7174-9D 07/23/96	Old-7174-12 07/23/96	Old-7174-13 07/23/96	Old-7174-14 07/23/96	Old-7174-15 07/23/96	Old-7174-16 07/23/96	Old-7174-17 07/23/96
Benzene	1	<1	<1	<1	<1	41	71	<1	<1	<1	< 1
Ethylbenzene	NA	<1	<1	<1	<1	15	12	<1	<1	<1	<1
Toluene	NA	<1	<1	<1	<1	<1	67	<1	<1	<1	<1
Xylenes	NA	<1	<1	<1	<1	3.6	139	<1	<1	<1	<1
Total VOAs	50	<4	<4	<4	<4	59.6	289	<4	<4	<4	<4
мтве	50	<1	<1	< 1	<1	<1	<1	<1	<1	< 1	<1
EDB	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Total Lead	50	16	12.7	8.8	5.4	30.9	61.4	5.5	16.2	21.7	4.8
TRPH	5	0.32	0.28	0.16	0.12	0.3	0.44	0.3	< 0.05	0.32	< 0.05
Naphthalene (Total)	100	<2	<2	<2	<2	32	6	<2	<2	<2	<2

Contamination Assessment Report
Building 7174 McCoy Annex, Exchange Service Station
Naval Training Center
Orlando, Florida

				<u> </u>						
	Chapter 62-770	Monitoring Well Number								
Parameter	FAC Target Cleanup Levels	Old-7174-18 07/23/96	Old-7174-19 07/23/96	Old-7174-20 07/23/96	Old-7174-21 07/23/96	Old-7174-22 07/23/96	Old-7174-23 07/23/96	Old-7174-13 9/13/96	Old-7174-22 9/13/96	Old-7174-23 9/13/96
Benzene	1	<1	<1	<1	<1	<1	< 1	NS	NS	NS
Ethylbenzene	NA	<1	<1	<1	<1	<1	<'1	NS	NS	NS
Toluene	NA	<1	<1	<1	<1	<1	< 1	NS	NS	NS
Xylenes	NA	<1	<1	<1	<1	<1	<1	NS	NS	NS
Total VOAs	50	<4	<4	<4	<4	<4	<4	NS	NS	NS
MTBE	50	<1	<1	<1	< 1	<1	<1	NS	NS	NS
EDB	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	NS	NS	NS
Total Lead	50	29.3	9.8	11.1	30.3	84.9	88.8	<3	4	<3
TRPH	5	< 0.05	0.08	< 0.05	< 0.05	< 0.05	< 0.05	NS	NS	NS
Total Naphthalene	100	<2	<2	<2	<2	<2	<2	NS	NS	NS

Notes: MW-11 was not sampled due to the presence of free product. MW-10 has been destroyed and, therefore, cannot be sampled.

MW-1, MW-2, MW-3, and MW-4 were destroyed during the tank removal on January 1995, therefore, they cannot be sampled. All laboratory readings were measured in $\mu g/\ell$, except lead, which was measured in mg/ℓ .

FAC = Florida Administrative Code.

NA = not applicable.

BDL =

Total VOAs = sum of concentration of benzene, toluene, ethylbenzene and xylenes.

VOAs = volatile organic aromatics.

MTBE = methyl tert-butyl ether.

NS = not sampled.

EDB = ethylene dibromide.

TRPH = total recoverable petroleum hydrocarbons.

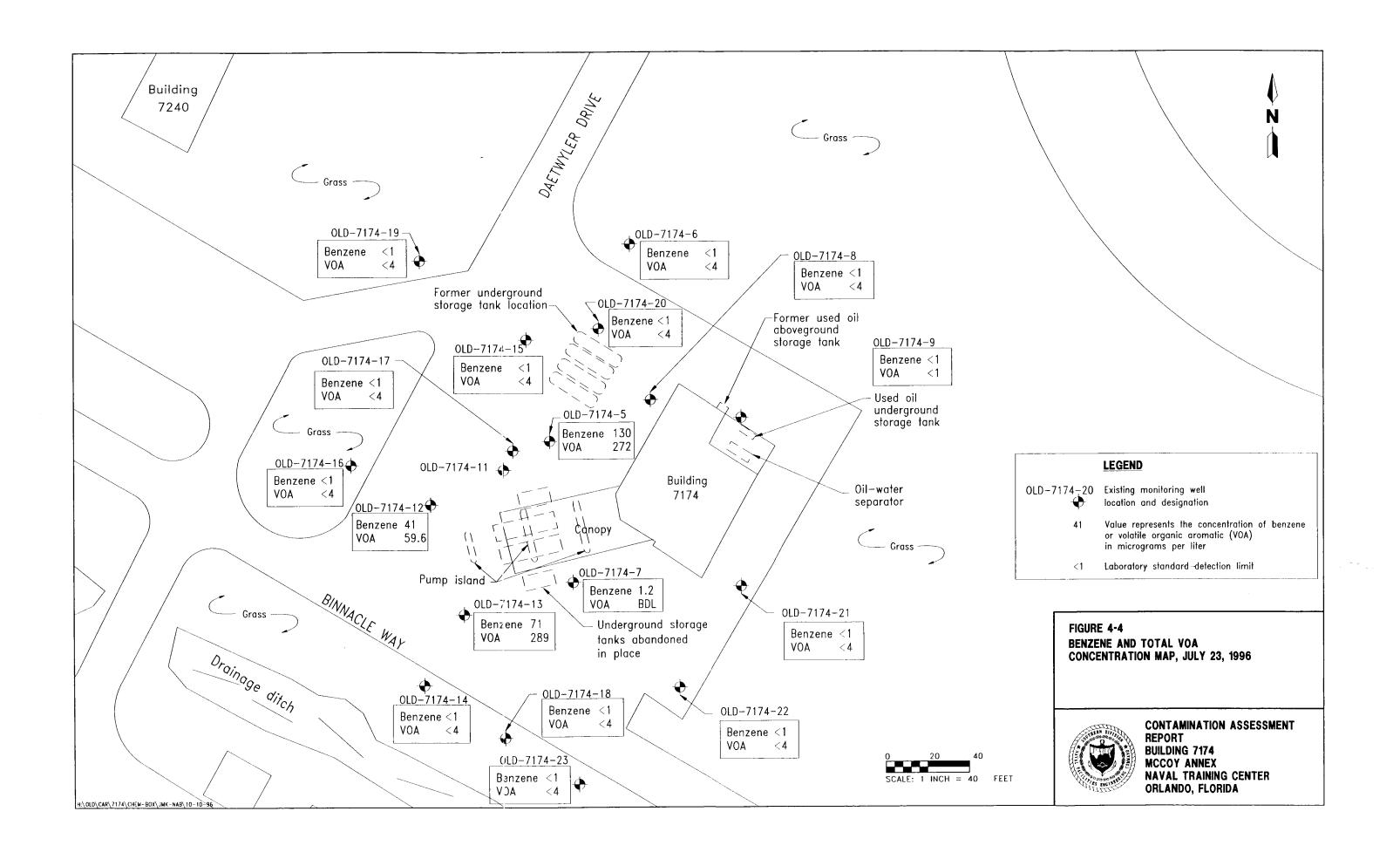
Total Naphthalene = sum of all naphthalene species.

ND = not detected.

J = indicates an estimated value.

< = less than.

Groundwater samples were collected from monitoring wells Old-7174-20 through Old-7174-23 on July 23, 1996. Groundwater samples were analyzed for the KAG, which includes USEPA Method 601 (VOHs), USEPA Method 602 (VOAs plus methyl tert-butyl ether), USEPA Method 504 (ethylene dibromide), USEPA 239.2 (total lead), USEPA Method 610 (PAHs), and USEPA Method 418.1 (total recoverable petroleum hydrocarbons). The July 23, 1996, laboratory analytical results indicate that benzene was detected at Old-7174-5 (130 micrograms per liter $[\mu g/\ell]$), Old-7174-12 $(41 \ \mu g/l)$ and $01d-7174-13 \ (71 \ \mu g/l)$. Total VOAs were detected above State cleanup level of Old-7174-5 (272 μ g/ ℓ), Old-7174-12 (59.6 μ g/ ℓ), and Old-7174-13 $(289 \mu g/l)$. Figure 4-4 shows the benzene and total VOA concentrations in groundwater. Also, total lead levels were above the State target cleanup levels at 01d-7174-12 (61.4 $\mu g/l$), 01d-7174-22 (84.9 $\mu g/l$), and 01d-7174-23 (88.8 $\mu g/\ell$). These wells were sampled on September 3, 1996, for lead using a quiescent sampling method. Laboratory analytical results indicated that lead concentrations are below laboratory standard detection limits. Figure 4-4 shows the benzene and total VOA concentration for the July 23, 1996, sampling event. The laboratory analytical reports are included in Appendix H.



5.0 SOURCE OF HYDROCARBONS

- <u>5.1 HYDROCARBON TYPE</u>. The hydrocarbon type formerly stored in UST 7174 at the site is unleaded gasoline and diesel fuel. Fingerprinting of free product from monitoring well Old-7174-11 identifies the product as unleaded gasoline.
- 5.2 SOURCE OF HYDROCARBON PLUME. The suspected source of the hydrocarbons in the groundwater and the soil is the product lines from the 10,000-gallon UST and the abandoned in-place UST. The downgradient plume is the result of an older spill or leakage that has migrated south.
- <u>5.3 MECHANISM OF TRANSPORT</u>. The primary mechanisms of transport is vertical percolation and the natural groundwater flow at the site. The groundwater flow direction shifts southeastward to eastward near the drainage canal across Binnacle Way. Apparently, these mechanisms are the reason contaminant migration has been carried offsite.

6.0 RECOMMENDATIONS

Based on the results of this investigation, ABB-ES recommends an RAP for this site.

NTC-7174.CAR ASW.10.96

7.0 PROFESSIONAL REVIEW CERTIFICATION

This document, Contamination Assessment Report, Building 7174, McCoy Annex, Naval Training Center, Orlando, Florida, has been prepared under the direction of a professional geologist registered in the state of Florida. The work and professional opinions rendered in this report were conducted or developed in accordance with commonly accepted procedures consistent with applicable standards This CAR is based on the geologic investigation and associated of practice. information detailed in the text and appended to this report or referenced in public literature. Recommendations are based upon interpretations of the applicable regulatory requirements, guidelines, and relevant issues discussed with regulatory personnel during the site investigation. If conditions that differ from those described are determined to exist, the undersigned geologist should be notified to evaluate the effects of any additional information on this assessment or the recommendations made in this report. This report meets the criteria set forth in Chapter 492 of the Florida Statutes with regard to good professional practices as applied to Chapter 62-770, FAC. This CAR was developed for the Building 7174 site at the McCoy Annex, NTC, Orlando, in Orlando, Florida, and should not be construed to apply to any other site.

> Manuel Alonso Professional Geologist P.G. No. 0001256

Date

REFERENCES

- ABB Environmental Services, Inc. (ABB-ES), 1993, Remedial Action Plan, McCoy Annex, Naval Training Center, Orlando: prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), North Charleston, South Carolina, April.
- ABB-ES, 1995a, Remedial Action Plan Addendum 2, McCoy Annex, Naval Training Center, Orlando: prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina, March.
- ABB-ES, 1995b, Technical Memorandum, McCoy Annex, Naval Training Center, Orlando, Florida: prepared for SOUTHNAVFACENGCOM, North Charleston, South Carolina, October.
- ABB-ES, 1995c, Contamination Assessment Report, McCoy Annex: prepared for: SOUTHNAVFACENGCOM, North Charleston, South Carolina, August.
- Driscoll, F.G., 1986, *Groundwater and Wells*: 2nd edition, St. Paul, Minnesota, Johnson Filtration Systems, Inc.
- Florida Department of Environmental Protection (FDEP), 1989, Guidelines for the Preparation of Contamination Assessment Reports for Petroleum Contaminated Sites, October.
- FDEP, 1994a, Guidelines for Assessment and Remediation of Petroleum Contaminated Soil, May.
- FDEP, 1994b, Ground Water Guidance Concentrations, June.
- OHM-Remediation Services Corp., 1993, Remedial Action Plan Addendum 1, McCoy Annex, Naval Training Center, Orlando, Florida, April.

APPENDIX A SITE PHOTOGRAPHS



Photograph 1:

View of Building 7174, facing North.



Photograph 2:

Closeup of the piezometers surrounding Old-7174-11.



Photograph 3: Facing southwest, former underground storage tank area at Building 7174.



Photograph 4: Facing northwest, former underground storage tank area at Building 7174.

APPENDIX B SUMMARY OF THE OVA DATA

Table B-1 Soil Sample Organic Vapor Analysis Results

Contamination Assessment Report
Building 7174 McCoy Annex, Exchange Service Station
Naval Training Center
Orlando, Florida

Barton Marakan		Depth Interval (feet bis)	
Boring Number	1-3	3-5	5-7
SB95-1	10	350	3,700
SB95-1A	900	1,200	900
SB95-2	>5,000	>5,000	>5,000
SB95-3	600	1,000	80
SB95-4	2,000	1,100	900
SB95-5	1,300	300	30
SB95-9	>5,000	>5,000	>5,000
SB95-10	1,200	240	40
SB95-11	0	0	0
SB95-12	3,000	12	700
SB95-13	500	0	140
SB95-14	>5,000	>5,000	>5,000
SB95-15	>5,000	290	2,000
SB95-16	0	0	0
SB95-17	0	0	0
SB95-18	0	0	0
SB95-19	0	0	0
SB95-20	160	5	420
SB95-21	1,200	300	210
SB95-23	2,000	1,500	1,300
SB95-24	18	3,000	600
SB95-25	0	0	0
SB95-26	1,400	>5,000	>5,000
SB95-27	0	0	0
SB95-28	0	0	0
SB95-29	0	0	0
SB95-30	0	0	0
SB95-31	0	0	50

Notes: All concentrations are in parts per million (ppm).

Samples were not taken for borings SB95-6, SB95-7, SB95-8, and SB95-22 due to the need for permits prior to drilling.

The effective range for the organic vapor analyzer is 1 ppm to 5,000 ppm. Actual sample concentrations may be less than 1 ppm or greater than 5,000 ppm and are outside the detection limits of the instrument. These data are a part of the original Remedial Action Plan, dated March 1993.

bis = below land surface

> = greater than.

Table B-2 Summary of Soil Sample Organic Vapor Analyzer Results, October 10, 1991

Contamination Assessment Report Building 7174 McCoy Annex, Exchange Service Station Naval Training Center Orlando, Florida

Boring Number	Depth (feet)	Unfiltered (ppm)	Filtered (ppm)	Actual (ppm)
SB1-1	2	1	1	0
SB1-2	4	10	1	9
SB2-1	2	10	0	10
SB2-2	4	20	0	20
SB3-1	2	1,000	0	1,000
SB3-2	4	150	0	150
SB4-1	2	500	0	500
SB4-2	4	21	0	21
SB4-3	6	2,600	0	2,600
SB5-1	2	1,300	0	1,300
SB5-2	4	1,500	0	1,500
SB5-3	5.5	1,700	0	1,700
SB6-1	2	200	25	175
SB6-2	4	1,000	70	930
SB6-3	6	500	16	484
SB6-4	7.5	900	35	865
SB8-1	2	150	37	113
SB8-2	4	100	10	90
SB8-3	6	60	5	55
SB9-1	2	1,000	200	800
SB10-1	2	50	0	50
SB10-2	4	100	30	70
SB10-3	7	9	0	9
SB11-1	2	0	0	0
SB11-2	5	15	10	5
SB11-3	7.4	5	0	5
SB12-1	2	2	0	2
SB12-2	5	0	0	0
SB13-1	2	10	0	10

Notes: Headspace samples were filtered with an activated carbon filter that allows only methane to pass through. The filtered reading is a measurement of methane gas in the sample and is subtracted from the unfiltered reading to obtain the actual hydrocarbon concentration.

Boring SB-7 was not reported. Met refusal at 3 feet below land surface.

These data are a part of the Technical Memorandum, dated October 1991.

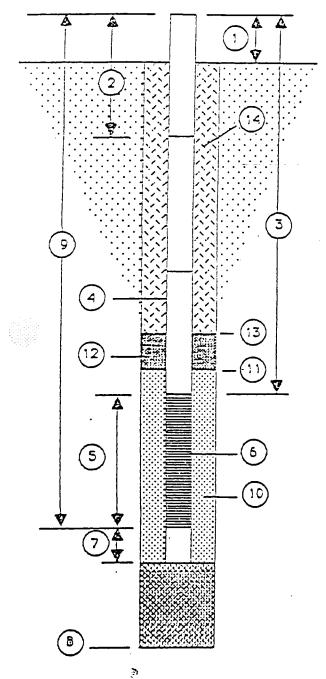
ppm = parts per million.

APPENDIX C WELL CONSTRUCTION DETAILS

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND 2:55 EAGLE DR., P. C. DOX 1006B CHARLESTON, S. C. 25411-006B



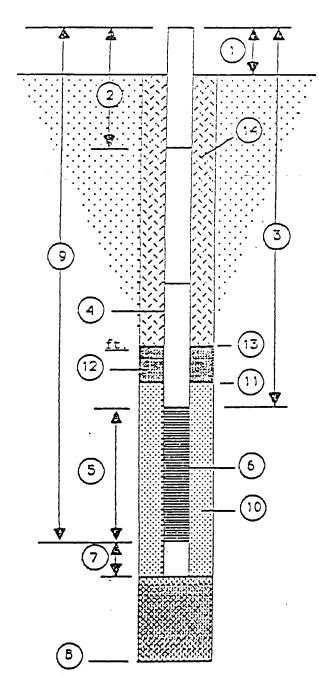
WELL CONSTRUCTION DETAILS

WELL NUMBER OLD-7174-5
DATE OF INSTALLATION 8-22-88
1. Height of Casing above ground N/A (flush mount)
2. Depth to first Coupling 2.3 ft.
Coupling Interval DepthsN/A
3. Total Length of Blank Pipe 2.3 ft.
4. Type of Blank Pipe Schedule 40 PVC. 2" ID
5. Length of Screen <u>10 ft.</u>
6. Type of Screen Schedule 40 PVC, #10 slot
7. Length of Sump N/A
8. Total Depth of Boring 13.5 ft. Hole Diameter 0.7 ft
9. Depth to Bottom of Screen 12.3 ft.
10. Type of Screen FilterSand
Quantity Used 200 lbs. Size 6/20 U/C
11. Depth to Top of Filter 2.0 ft.
12. Type of Seal <u>Bentonite pellets</u>
Quantity Used 1/4 bucket (5 gal. bucket)
13. Depth to Top of Seal <u>1.0 ft.</u>
14. Type of Grout Concrete
Grout Mixture
Method of Placement

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND 2135 EAGLE DHI, P. C. BOX 10060 CHARLESTON, S. C. 25411-0068



WELL CONSTRUCTION DETAILS

WE	LL NUMBER <u>OLD-7174-6</u>
DA	TE OF INSTALLATION 8-23-88
1.	Height of Casing above ground 2.25 ft.
2.	Depth to first Coupling 5.0 ft.
	Coupling Interval DepthsN/A
3.	Total Length of Blank Pipe5.0 ft
4.	Type of Blank Pipe Schedule 40 PVC. 2" ID
5.	Length of Screen <u>10 ft.</u>
6.	Type of ScreenSchedule 40 PVC, =10 slot
7.	Length of Sump N/A
8.	Total Depth of Boring <u>13.0 ft.</u> Hole Diameter <u>0.7</u>
9.	Depth to Bottom of Screen 15.0 ft.
10.	Type of Screen Filter Sand
	Quantity Used 200 lbs. Size 6/20 U/C
11.	Depth to Top of Filter 2.0 ft.
12.	Type of SealBentonite pellets
	Quantity Used 1/4 bucket (5 gal. bucket)
13.	Depth to Top of Seal 1.0 ft.
14.	Type of Grout <u>Concrete</u>
	Grout Mixture

COMMENTS ON INSTALLATION: Well OLD-1-6 was drilled twice. Originally, the bottom of the well screen popped off and large amounts of sand were clogging the pumps during development. It was redrilled and set on 8-24-88 in the original borehole.

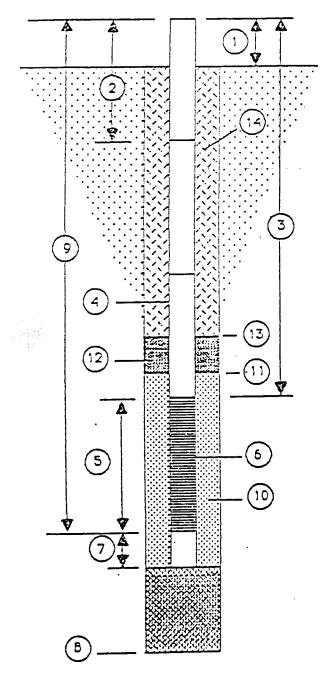
Method of Placement

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND 2:25 EAGLE DR., P. C. DOX 1006B

CHARLESTON, S. C. 15411-0068



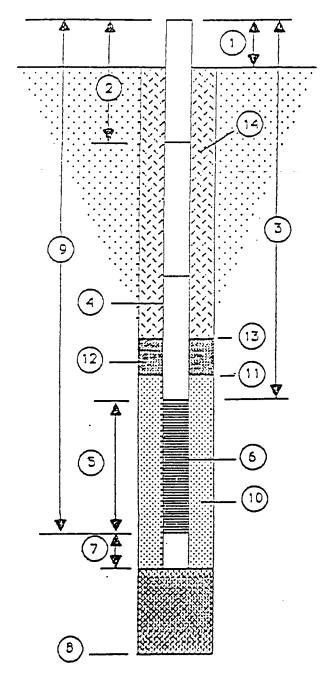
WELL CONSTRUCTION DETAILS

WE	L NUMBER OLD-7174-7
DAT	TE OF INSTALLATION 8-23-88
1.	Height of Casing above ground N/A (flush mount):
2.	Depth to first Coupling2.5 ft.
	Coupling Interval DepthsN/A
3.	Total Length of Blank Pipe 2.5 ft.
4.	Type of Blank Pipe Schedule 40 PVC, 2" ID
5.	Length of Screen <u>10 ft.</u>
6.	Type of Screen Schedule 40 PVC, #10 slot
7.	Length of Sump N/A
8.	Total Depth of Boring 13.0 ft. Hole Diameter 0.7 ft
9.	Depth to Bottom of Screen 12.5 ft.
10.	Type of Screen FilterSand
	Quantity Used 275 lbs. Size 6/20 U/C
11.	Depth to Top of Filter 1.5 ft.
12.	Type of Seal Bentonite pellets
	Quantity Used 1/3 bucket (5 gal. bucket)
13.	Depth to Top of Seal 0.5 ft.
14.	Type of Grout <u>Concrete</u>
	Grout Mixture
	Method of Placement

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND 2125 EAGLE DR., F. O. EOX 1006B CHARLESTON, S. C. 29411-006B



WELL CONSTRUCTION DETAILS

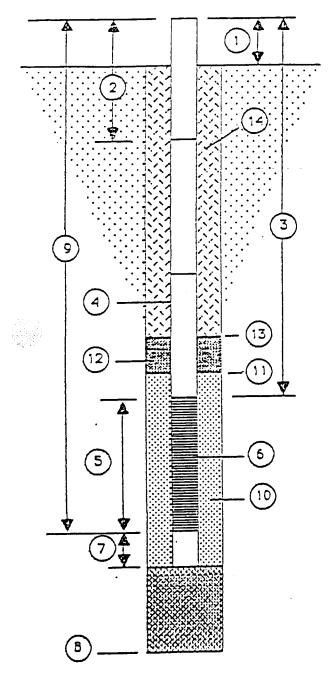
WE	LL NUMBER OLD-7174-8
DA	TE OF INSTALLATION8-23-88
1.	Height of Casing above ground N/A (flush mount)
2.	Depth to first Coupling 2.45 ft.
	Coupling Interval Depths N/A
3.	Total Length of Blank Pipe 2.45 ft.
4.	Type of Blank Pipe Schedule 40 PVC. 2" ID
5.	Length of Screen <u>10 ft.</u>
6.	Type of Screen Schedule 40 PVC. #10 slot
7.	Length of Sump N/A
8.	Total Depth of Boring 13.0 ft. Hole Diameter 0 7 ft
9.	Depth to Bottom of Screen 12.45 ft.
10.	Type of Screen FilterSand
	Quantity Used 200 lbs. Size 6/20 U/C
11.	Depth to Top of Filter 2.0 ft.
12.	Type of Seal <u>Bentonite pellets</u>
	Quantity Used 1/4 bucket (5 gal, bucket)
13.	Depth to Top of Seal 1.0 ft.
14.	Type of Grout Concrete
	Grout Mixture
	Method of Placement

COMMENTS ON INSTALLATION:

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND 2:55 EAGLE DR., P. O. DOX : DOGB CHARLESTON, S. C. 2941:1-0068



WELL CONSTRUCTION DETAILS

WEI	L NUMBEROLD-7174-9
DA:	TE OF INSTALLATION 8-23-88
1.	Height of Casing above ground N/A (flush mount)
2.	Depth to first Coupling 2.4 ft.
	Coupling Interval DepthsN/A
3.	Total Length of Blank Pipe 2.4 ft.
4.	Type of Blank Pipe Schedule 40 PVC, 2" ID
5.	Length of Screen 10 ft.
6.	Type of Screen Schedule 40 FVC. #10 slot
7.	Length of Sump N/A
8.	Total Depth of Boring 13.0 ft. Hole Diameter 0.7 ft
9.	Depth to Bottom of Screen 12.4 ft.
10.	Type of Screen FilterSand
	Quantity Used 325 lbs. Size 6/20 U/C
11.	Depth to Top of Filter 1.5 ft.
12.	Type of Seal Bentonite pellets
	Quantity Used 1/4 bucket (5 gal. bucket)
13.	Depth to Top of Seal0.7 ft
14.	Type of Grout Concrete
	Grout Mixture
	Method of Placement

DEPARTMENT OF THE NAVY

SOUTHERN DIVISION

naval facilities engineering command 2135 Eagle Dr., P. C. Dox 1006b

CHARLESTON, S. C. 29411-0068

5

WELL CONSTRUCTION DETAILS

WE	LL NUMBER OLD-7174-10
DA'	TE OF INSTALLATION 8-23-88
1.	Height of Casing above ground 1.5 ft
2.	Depth to first Coupling 5.0 ft.
	Coupling Interval DepthsN/A
3.	Total Length of Blank Pipe 5.0 ft.
4.	Type of Elank Pipe Schedule 40 PVC. 2" ID
5.	Length of Screen 10 ft.
6.	Type of Screen Schedule 40 PVC, #10 slot
7.	Length of Sump N/A
8.	Total Depth of Boring 14.0 ft. Hole Diameter 0.7 ft
9.	Depth to Bottom of Screen 15.0 ft.
10.	Type of Screen FilterSand
	Quantity Used 250 lbs. Size 6/20 U/C
11.	Depth to Top of Filter
12.	Type of Seal Bentonite pellets
	Quantity Used 1/4 bucket (5 gal. bucket)
13.	Depth to Top of Seal 1.0 ft.
14.	Type of Grout Concrete
	Grout Mixture
	Method of Placement

Water Mgmt. Dist.:

St. Johns

Site Information:

Permit Number:

Name:

NTC

Work Order:

6042

Address: C.S.Z:

Main Base Orlando, Florida

Type of Well: Well Number: Old 7174-23

Monitor

S/T/R:

Client / Consultant Information

Method Used: Borehole Dia.

61/4 HSA <u>10"</u>

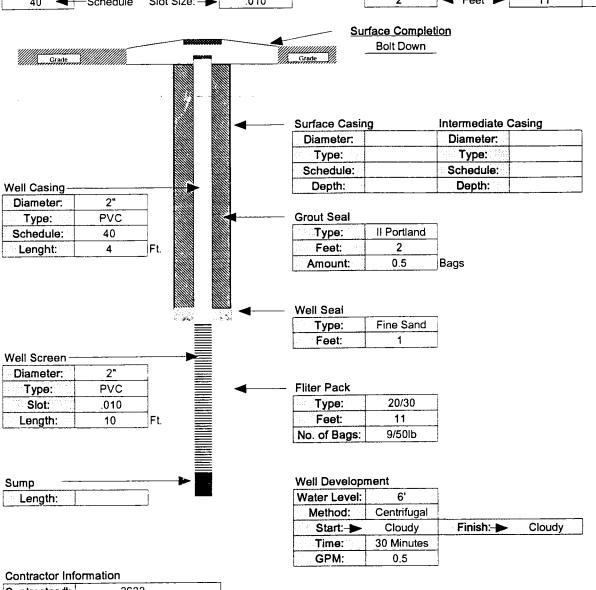
Consultant:

ABB Environmental Services

Field Rep:

Scott Donelick

Well Diameter	Well Type	Well Depth	Screen Length	Casing Length	Bags Grout	Sand Bags/Weight	Filter Type	Well Seal
2"	PVC	14	10	4	0.5	9/50lb	20/30	Fine Sand
40 ◀	Schedule	Slot Size:	.010		2	◄ - Feet -▶	11	1



Contractor #:	2633	
Completion:	07/12/96	
Driller:	Todd Flick	
Lead Hand:	Robert Detweiler	
3rd Man:	Brian Burgess	
Drill Rig:	D120-C	

Company: Groundwater Protection, Inc.

Address:

4315 S.W. 34th Street

C,S,Z:

Orlando, Florida 32811

Phone/FAX: (407) 426-7885 / (407) 426-7586

Water Mgmt. Dist.:

St. Johns

Site Information:

Permit Number:

Name: Address: NTC

Work Order:

6042

C,S,Z:

Main Base Orlando, Florida

Type of Well:

Monitor

S/T/R:

Well Number: Old 7174-22

Client / Consultant Information

Method Used:

61/4 HSA

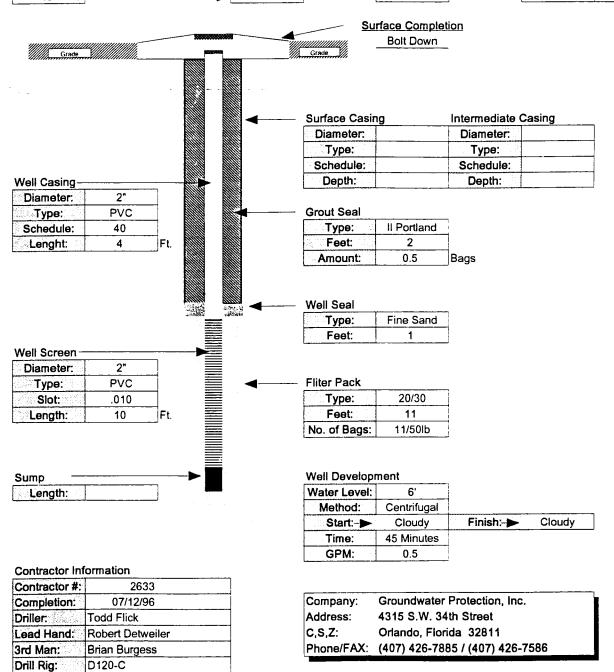
Consultant:

Field Rep:

ABB Environmental Services Scott Donelick

Borehole Dia. <u>10"</u>

Well	Well	Well	Screen	Casing	Bags	Sand	Filter	Well
Diameter	Type	Depth	Length	Length	Grout	Bags/Weight	Туре	Seal
2*	PVC	14	10	4	0.5	11/50lb	20/30	Fine Sand
40 ◀-	Schedule	Slot Size: →	.010		2	Feet →	11	1



Water Mgmt. Dist.:

St. Johns

Site Information:

Permit Number:

Name: Address: NTC

Main Base

Orlando, Florida

Work Order:

6042

C,S,Z: S/T/R:

Type of Well: Well Number: Old 7174-21

Monitor

Client / Consultant Information

Method Used:

61/4 HSA

ABB Environmental Services

Borehole Dia.

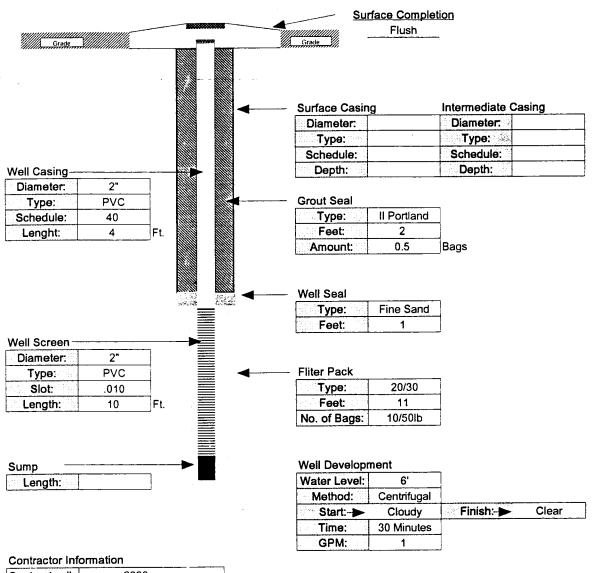
<u>10"</u>

Consultant:

Scott Donelick

Field Rep:

Well Diameter	Well Type	Well Depth	Screen Length	Casing Length	Bags Grout	Sand Bags/Weight	Filter Type	Well Seal
2"	PVC	14	10	4	0.5	10/50lb	20/30	Fine Sand
40 ◀-	Schedule	Slot Size:-▶	.010		2	← Feet →	11	1



Contractor #:	2633	
Completion:	07/12/96	
Driller:	Todd Flick	
Lead Hand:	Robert Detweiler	
3rd Man:	Brian Burgess	
Drill Rig:	D120-C	

Groundwater Protection, Inc. Company:

Address:

4315 S.W. 34th Street

C,S,Z:

Orlando, Florida 32811 Phone/FAX: (407) 426-7885 / (407) 426-7586

Name:

Address:

Water Mgmt. Dist.:

St. Johns

Site Information:

Permit Number:

NTC Main Base

Work Order:

<u>6042</u>

C,S,Z:

Type of Well: Well Number: Old 7174-20

Monitor

S/T/R: Client / Consultant Information

Method Used:

61/4 HSA

Consultant:

ABB Environmental Services

Borehole Dia.

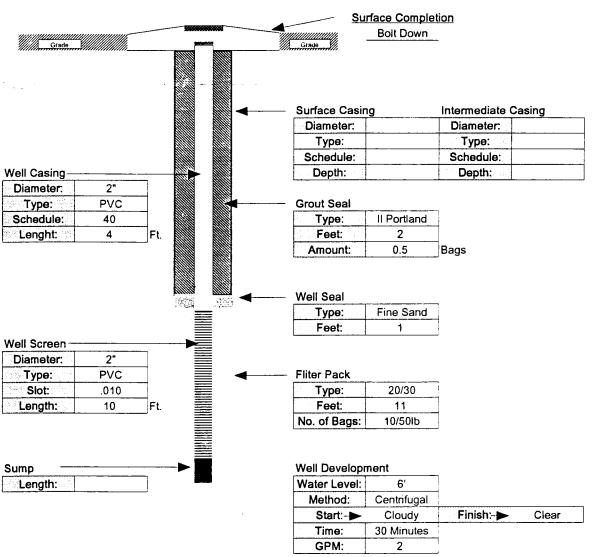
10"

Field Rep:

Scott Donelick

Orlando, Florida

Well	Well	Well	Screen	Casing	Bags	Sand	Filter	Well
Diameter	Туре	Depth	Length	Length	Grout	Bags/Weight	Туре	Seal
2*	PVC	14	10	4	0.5	10/50lb	20/30	Fine Sand
40 ◀-	Schedule	Slot Size:	.010		2	⋖ - Feet -►	11	1



Contractor Information

Contractor #:	2633	
Completion:	07/12/96	
Driller:	Todd Flick	
Lead Hand:	Robert Detweiler	
3rd Man:	Brian Burgess	
Drill Rig:	CME-55	

Groundwater Protection, Inc. Company: Address: 4315 S.W. 34th Street

Orlando, Florida 32811

C,S,Z:

(407) 426-7885 / (407) 426-7586 Phone/FAX:

APPENDIX D LITHOLOGIC LOGS

LOCATION: NTC McCoy Annex Base Exchange Service Station, Orlando FL

Log of Boring/Well No.: OLD-7174-5

	1		1	1
Depth (Feet)		Spl 	MATERIAL DESCRIPTION	WELL CONSTRUCTION FLUSH MOUNT PROTECTA STEEL MANHOLE
	 			LOCKING PVC CAF
-			limestone fill (asphalt)	CONCRETE
	i 	I X	black fine sand with silt and much organics	GROUT & PAD BENTONITE SEAL
5	 			2° DIA. SCH. 40 PVC CASING
	! 	i 		NO. 6-20 SAND FILTER PACK
10		! !		1 2° DIA. SCH. 40
	! !	l I		PVC SCREEN 0.010' SLOT
	!	 	end of boring @ 14:25 8-22-88 	
15	<u></u>	<u> </u> 		<u>.</u> <u>1</u>
20				
1				_
i				
25				<u>-</u>
.	!			
!]	! ! j		
30				

Boring Completion Date: 8-22-88 Boring Diameter: 8.5 inches
Well Completion Date: 8-22-88 Ground Elevation: 799.7 ft Well Development Date: 8-23-88
Drilling Method: Hollow stem auger Depth to Water: 4.29 ft from TOC

Top of Casing Elev.: 99.45 ft Driller: Bill Briggs Logged By: <u>Ken Busen</u>

LOCATION: NTC McCoy Annex Base Exchange Service Station, Orlando FL

Log of Boring/Well No.: OLD-7174-6

	1				
Depth		Spl	MATERIAL DESCRIPTION	WELL CONSTR	UCTION
(Feet)	<u> </u>] 1	} 	<u> </u>	LOCKING STEEL WELL COVER
			İ		
			 black fine to medium sand		CONCRETE
-	! }	1 	Disch Time to mediam being		GROUT & PAD
	<u> </u>	l			- BENTONITE SEA!
5	<u> </u>	X !	tan fine sand Groundwater level = 4.05 ft BLS		2° DIA, SCH, 40PVC CASING
<u> </u>	1	 	I grades to off-white fine sand	ī 📳	
		ļ '	light grey fine sand	!	- NO. 6-20 SANI FILTER PACK
	! !	 	I Tight Grey fine Sand	'l 🗐	
10	<u>. </u>			i 📑 💳	- 2° DIA. SCH. 40 PVC SCP
] 1	 		¦ III	0.010' SL
	, 		end of boring @ 16:30 8-24-88	j	
2.5				1	
15	l 	l.,	! 	<u>.</u> 1	
				1	
	!]]	
20	1 .]		1	1 1	
<u></u>				Ī	
		!		j T	
25	<u> </u>			<u> </u>	
,	[]			 	
				i	
30	!			!	
30	1			<u> </u>	

Boring Completion Date:	<u>8-24-88</u>
Well Completion Date:	
Well Development Date:	
Drilling Method: Hollow	
Depth to Water: 6 30 ft	

Boring Diameter: 8.5 inches
Ground Elevation: 99.57 ft
Top of Casing Elev.:101.82 ft
Driller: Bill Briggs
Logged By: Mark Diblin

LOCATION: NTC McCov Annex Base Exchange Service Station, Orlando FL

Log of Boring/Well No.: OLD-7174-7

	'	l – – – ¹	1	1	
Depth (Feet)	_	Spl	MATERIAL DESCRIPTION	WELL CONSTRUCTION FLUSH MOUNT PROTECTION STEEL MANHOLE)T
	, 		, 	LOCKING PVC	C.
	; [l limestone fill (asphalt) black fine sand with woody material (fill)	CONCRETE GROUT & PAD BENTONITE SEA	41
5	! !	X		20 714 504 4	
			brown fine sand crades to clavev brown fine to	NO. 6-20 SAN FILTER PACK	12
10		<u> </u>	medium sand	2' DIA. SCH. 4 PVC SCREEN C.010' SLOT	С
		; 	end of boring @ 08:25 8-23-88	0.010 \$101	
<u>15 </u>		<u> </u>		<u> </u> 	
1 20 1		! ! 1		 	
! !	 	 		! ! !	
25 I	<u> </u>	1		I L	
 	1	1] 	
30 1	1	. !		1 	_

Boring Completion Date: 8-23-88
Well Completion Date: 8-23-88
Well Development Date: 8-23-88
Drilling Method: Hollow stem auger
Depth to Water: 5.07 ft from TOC

Boring Diameter: 8.5 inches
Ground Elevation: 799.73 ft
Top of Casing Elev.: 99.53 ft
Driller: Bill Briggs
Logged By: Mark Diblin

LOCATION: NTC McCoy Annex Base Exchange Service Station, Orlando FL

Log of Boring/Well No.: OLD-7174-8

	1	1	1	1
Depth (Feet)	Sym 	Spl	MATERIAL DESCRIPTION	WELL CONSTRUCTION FLUSH MOUNT PROTECTS STEEL MANHOLE
	;] 1	 	 	LOCKING PVC CAF
· .]]	concrete	CONCRETE GROUT & PAD
] 	1]	dark brown to black fine sand	BENTONITE SEAL
5	! !	X <u> </u>	<u>light brown to tan fine sand</u> Groundwater level = 4.36 ft BLS	2° DIA. SCH. 40 PVC CASING
	! !	i !		NO. 6-20 SAND FILTER PACK
	i i	 		i 📗
10	<u>!</u> }			1 2' DIA. SCH 10 PVC SCRE 0.010' SLO'.
] !] !	end of boring @ 09:18 8-23-88	0.010 \$20.
15	! !			<u>1</u>
	· 	 		
	 			1 1
20				<u> </u>
				1
] 		
25				<u>L</u>
30				
30	<u> </u>			L <u> </u>

Boring Completion Date:	<u>8-23-88</u>
Well Completion Date:	8-23-88
Well Development Date:_	
Drilling Method: Hollow	
Denth to Water: 4 36 ft	

Boring	Diameter:_	8.5 inches
		~100.23 ft
		v.: 99.83 ft
		riogs
	By: Ken Bu	

LOCATION: NTC McCoy Annex Base Exchange Service Station, Orlando FL

Log of Boring/Well No.: OLD-7174-9

				1
Depth (Feet)		 Spl 	MATERIAL DESCRIPTION	WELL CONSTRUCTION FLUSH MOUNT PROTECT:
	 	 X	sand : brown to black fine sand	GROUT & PAD BENTONITE SEAL 2' DIA. SCH. 40 PVC CASING
<u>5</u>		! 	Groundwater level = 4.07 ft BLS	NO. 6-20 SAND
10		! ! !		2' DIA. SCH. 40 PVC SCREEN 0.010' SLOT
!	 	 		
15	~	! 		<u> </u>
20		l 		1 1 <u>1</u>
	i !] [
25		i ! 		<u>i</u>
30	 	! ! !		

Boring Completion Date: 8-23-88
Well Completion Date: 8-23-88
Well Development Date: 8-24-88
Drilling Method: Hollow stem auger
Depth to Water: 4.07 ft from TOC

Boring Diameter: 8.5 inches
Ground Elevation: 100.28 ft
Top of Casing Elev.: 99.88 ft
Driller: Bill Briggs
Logged By: Ken Busen

LOCATION: NTC McCoy Annex Base Exchange Service Station, Orlando FL

Log of Boring/Well No.: OLD-7174-10

	1		I 	1
Depth (Feet)		Spl	MATERIAL DESCRIPTION	WELL CONSTRUCTION LOCKING STEEL WELL COVER
	 	 	 	CONCRETE
5	} 	} X 		GROUT & PAD BENTONITE SEA 2' DIA. SCH. 2 PVC CASING
]	Tranc Drown to tan Time same	NO. 6-20 SAN FILTER FACK
10	 	 		2° DIA. SCH 40 PVC SC; 0.010° SL
 15			end of boring @ 1341 8-23-88	
20 <u>1</u> 1]		- -
25	, 	1		_
· 	1	 		
30	1			

Boring Completion Date:	8-23-88
Well Completion Date:	8-23-88
Well Development Date:_	
Drilling Method: Hollow	
Depth to Water: 4.97 ft	

Boring	Diameter:	8.5 inches
Ground	Elevation:_	98.94 ft
Top of	Casing Elev.	.: <u>100.44 ft</u>
	:: Bill Br	
	By: Ken Buse	

TITLE: NTC Orlando, Mo	cCoy Annex		LOG o	WELL: OLD 7514-	11	BOR	ING NO.			
CLIENT: SOUTHNAVFA	CENGCOM					PRO	JECT NO: 7514-40			
CONTRACTOR: Groundw	ater Protec	ction Inc.		DATE STARTED:	8/18/91		COMPLTD: 6/18/	91		
METHOD: HSA		CASE SIZE: 2 inch		SCREEN INT. 3	' to 13'	PROT	ECTION LEVEL: D			
TOC ELEV.: 99.18 (assu	umed) FT.	MONITOR INST: OVA		TOT OPTH: 13FT.		DPTH	I TO ¥ 5.07 FT.			
LOGGED BY: B. Steven	15	WELL DEVELOPMENT	DATE: 6/	18/91		SITE	SITE: NTC Orlando			
DEPTH LALANDERO FT. THE SAMPLE TO SAMPLE	RECOVERY HEADSPACE (DDM)	SOIL/ROCK	DESCRIPT	TON	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-]N	WELL DATA		
5	2/2	SAND: Dark brown silty, fir Fuel odor, wood chips SAND: Grey fine grain SAND: Brown silty to fine s		ium grain sand.		SP SM SM				
20		PAGE	E 1 <u>of</u> OL	□11 ARR	ENVIRON	IMENT	AL SERVICES.	TNC		

TITLE: NTC Orlando,	McCay Annex		LOG o	WELL: OLD 7174-12	2	воя	LING NO.	
CLIENT: SOUTHNAVE	ACENGCOM			-		PRO	JECT NO: 7514-40	
CONTRACTOR: Ground	lwater Protect	ion Inc.		DATE STARTED:	3/18/91		COMPLTD: 8/18/	91
METHOD: HSA		CASE SIZE: 2 inch		SCREEN INT. 3'	T0 14'	PROT	ECTION LEVEL: D	
TOC ELEV.: 98.86 (a	ssumed) FT.	MONITOR INST: 0VA	4	TOT DPTH: 13FT.		DPTH	i το ፯ 5.85 FT.	
LOGGED BY: B. Steve	ens	WELL DEVELOPMENT	DATE: 8/	18/91		SITE	: NTC Orlando	
DEPTH PARTY TO THE SAMPLE OF THE SAMPLE SAMP	RECOVERY HEADSPACE (ppm)	SOIL/ROCK	DESCRIPT	TION	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5—		SAND: Dark brown silty, fin sand. Wood debris SAND: Dark brown to brow				SM		
		PAGE	1 of OL	D12 ABB E	NVIRON	MENT	AL SERVICES.	INC.

CONTRACTOR: Groundwater Protection Inc. DATE STARTED: 8/18/91 METHOD: HSA CASE SIZE: 2 inch SCREEN INT:: 3' to 13' TOC ELEV.: 98.88 (assumed) FT. MONITOR INST:: 0VA TOT DPTH: 13FT. LOGGED BY: B. Stevens WELL DEVELOPMENT DATE: 8/18/91 ### SOIL/ROCK DESCRIPTION SAMPLE 1D. 30 DO DESCRIPTION SAMPLE 1D. 30 DO DESCRIPTION SAND: Dark brown silty, fine to medium grain. Strong fuel oddr SAND: Grey to brown fine grain. Very strong fuel oddr	PROJECT NO: 717 4- COMPLTD: 6 PROTECTION LEVEL DPTH TO \$ 5.65 FT. SITE: NTC Orlando SS BLOWS/6-1	.: D .: D
METHOD: HSA CASE SIZE: 2 Inch TOC ELEV.: 98.88 (assumed) FT. MONITOR INST: OVA TOT DPTH: 13FT. LOGGED BY: B. Stevens WELL DEVELOPMENT DATE: 8/18/91 SOIL/ROCK DESCRIPTION SAMPLE ID. SAMPLE ID. SAMPLE ID. SAMPLE ID. SAMD: Dark brown silty, fine to medium grain. Strong fuel odor SAND: Grey to brown fine grain. Very strong fuel odor	PROTECTION LEVEL DPTH TO \$ 5.85 FT. SITE: NTC Orlando SY BLOWS/6-1	.: 0
TOC ELEV.: 98.86 (assumed) FT. MONITOR INST: OVA TOT DPTH: 13FT. LOGGED BY: B. Stevens WELL DEVELOPMENT DATE: 8/18/91 LABORATORY HAVE SAMPLE 1D. SOJL/ROCK DESCRIPTION SOJL/ROCK DESCRIPTION SAND: Bark brown silty, fine to medium grain. Strong fuel odor SAND: Grey to brown fine grain. Very strong fuel odor	SITE: NTC Orlando SS BLOWS/6-1 SM	
WELL DEVELOPMENT DATE: 8/18/91 LABORATORY AND: Dark brown silty, fine to medium grain. Strong fuel odor SAND: Grey to brown fine grain. Very strong fuel odor	SITE: NTC Orlando SSY BLOWS/6-1 SM	
THE LABORATORY HE SAMPLE 1D. VO JE SAND: Dark brown silty, fine to medium grain. Strong fuel odor SAND: Grey to brown fine grain. Very strong fuel odor	SOIL CLASS	Z WELL DATA
SAND: Dark brown silty, fine to medium grain. Strong fuel odor SAND: Grey to brown fine grain. Very strong fuel odor	SM	MELL DATA
SAND: Grey to brown fine grain. Very strong fuel odor		
SAND: Dark brown to black silty, fine grain SAND: Light brown fine grain some silt	SP	

TITLE: NTC Orlando, McCoy Ar	nnex		LOG of	WELL: OLD 7174	-14	BOR	ING NO.	
CLIENT: SOUTHNAVFACENGE	MC		·			PRO	JECT NO: 7514-40	
CONTRACTOR: Groundwater Pro	otection	Inc.		DATE STARTE	D: 8/18/91		COMPLTD: 6/18/	91
METHOD: HSA		CASE SIZE: 2 inch		SCREEN INT. 3' to 10'		PROT	ECTION LEVEL: D	
TOC ELEV.: 99.27 (assumed) F	T	MONITOR INST. OVA	VA TOT OPTH: 13FT.		Τ.	DPTH	I TO \$ 7.21 FT.	
LOGGED BY: B. Stevens		WELL DEVELOPMENT	DATE: 5/	18/91		SITE	:NTC Orlando	
DEPTH FT. ST. GDAYAGE GDAYAGE SAMPLE RECOVERY	HEAUSPACE (DDm)	SOIL/ROCK	DESCRIPT	JON	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-JN	WELL DATA
5— 2/2	CLA	ID: Brown silty, fine to YEY SAND: Dark brown	ı very low	clay content		SM SM		
15								
20	I	PAGE	1 of OLE	014 ABB	ENVIRON	' MENT	AL SERVICES,	INC.

TITLE: NTC Orlando, McCoy Annex		LOG of	WELL: OLD 7174-	15	BOF	RING NO.	
CLIENT: SOUTHNAVF ACENGEOM		· ·			PRO	JECT NO: 7514-40	
CONTRACTOR: Groundwater Protection	Inc.		DATE STARTED	8/18/91		COMPLTD: 8/18/	' 91
METHOD: HSA	CASE SIZE: 2 inch		SCREEN INT. 5	' to 15'	PRO	TECTION LEVEL: D	
TOC ELEV.: 99.08 (assumed) FT.	MONITOR INST: OVA	\	ТОТ ОРТН: 15FT		DPTI	DPTH TO ₹ 4.89 FT.	
LOGGED BY: B. Stevens	WELL DEVELOPMENT	DATE: 8/	18/91		SITE	E: NTC Orlando	
DEPTH FT. FT. CILLAWERY OILAWERY OILAWERY COLOUGERY HEADSPACE (ppm)	S0]L/ROCK	DESCRIPT	TION	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
SAI	ND: Dark brown silty, fir				SM SP		
20	D 4 C 5	<u> 1 of Ol</u>	D15 APP	ENIVIDO	(MEXI	TAL SERVICES	TNC

TITLE: NTC Orlando, McCoy Annex		LOG o	WELL: OLD 7174	-18	BORI	ING NO.	
CLIENT: SOUTHNAVFACENGCOM		1	· · · · · · · · · · · · · · · · · · ·		PROJ	JECT NO: 7514-40	
CONTRACTOR: Groundwater Protection	on Inc.		DATE STARTED); 6/18/91		COMPLTD: 6/18/	91
METHOD: HSA	CASE SIZE: 2 inch		SCREEN INT.	8''	PROT	ECTION LEVEL: D	
TOC ELEV.: 99.31 (assumed) FT.	MONITOR INST.: OVA		TOT DPTH: 15FT. DPTH TO		TO ¥ 6.40 FT.		
LOGGED BY: B. Stevens	WELL DEVELOPMENT	DATE: 8/	18/91		SITE:	NTC Orlando	
DEPTH FT. FT. OI STAWNOR SAMPLE SAMPLE SAMPLE HEADSPACE (PPM)	SOJL/ROCK	DESCRIPT	TON	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
5—	SAND: Dark brown silty, fire SAND: Grey fine grain SAND: Brown silty fine to a	medium gr			SM SM		
20—	PAGE	1 of OL	D16 ABE	ENVIRON	MENT	AL SERVICES.	INC.

ITLE: NTC Orta	ndo, McCoy	Annex		LOG of	#ELL: OLD 7174-	-17	BOR	ING NO.	
LIENT: SOUTHN	NAVF ACENG	COM					PRO	JECT NO: 7514-40	
ONTRACTOR: G	roundwater	Protection	on Inc.		DATE STARTED	: 6/18/91		COMPLTD: 8/19/	91
ETHOD: HSA			CASE SIZE: 4 inch		SCREEN INT. 3	31' to 38'	PROT	ECTION LEVEL:	
OC ELEV.: 99.17	7 (assumed)	FT.	MONITOR INST: 0VA		TOT DPTH: 37F1	FT. DPTH TO \$ 5.85 FT.			
OGGED BY: B. :	Stevens		WELL DEVELOPMENT	DATE: 8/	19/91		SITE	NTC Orlando	
L LABORATOR SAMPLE 1D.	SAMPLE SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK	(DESCRIPT	TION	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5—	1.1/2		AND: Dark brown silty, fitrong tuel odor				SP SM	10,5,5,4	
D—	.9/2	0	dor				SP	5,5,6,8	
5—	1/2		AND: Light grey medium t	to coarse	grain		SP	5,5,4,8	
)—	2/2	S	AND: Grey fine to medium	n grain			SM	3,2,3,3	
5—	2/2	S	AND: Dark brown silty to	medium gr	ain		SP	2,2,4,8	
)—	2/2							3,2,3,3	
5	2/2	S	AND: Grey fine to medium	n grain				1,2,4,5	

TITLE: NTC Orlando, McCoy Annex		LOG o	1 WELL: OLD 7174	-18	BOR	ING NO.	
CLIENT: SOUTHNAVFACENGCOM				. ,	PRO	JECT NO: 7514-40	
CONTRACTOR: Groundwater Protectio	n Inc.		DATE STARTE	D: 8/18/91		COMPLTD: 8/18/	91
METHOD: HSA	CASE SIZE: 2 inch		SCREEN INT.	3' to 13'	PROT	ECTION LEVEL: D	
TOC ELEV.: 99.04 (assumed) FT.	MONITOR INST: 0VA	Α	TOT DPTH: 13F	т.	DPTH	DPTH TO ▼ 7.20 FT.	
LOGGED BY: B. Stevens	WELL DEVELOPMENT	DATE: 8	18/91		SITE	: NTC Orlando	
DEPTH FT. FT. CI JAMPS CI JAMPS SAMPLE SAMPLE RECOVERY HEADSPACE (ppm)	SOIL/ROCK	(DESCRIP	FION	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5—	AND: Dark brown,with so dium grain. Some clay	and wood	debris.		SM		
20—	PAGE	<u> 1 of OL</u>	D18 AB E	I I BENVIRON) MENT	AL SERVICES.	INC.

TITLE: NTC Orlando, McCoy	Annex		LOGo	f WELL: OLD 7174	-19	BOR	BORING NO.	
CLIENT: SOUTHNAVFACENG	COM		·			PRO	JECT NO: 7514-40	
CONTRACTOR: Groundwater		Inc.		DATE STARTED	0: 6/19/91		COMPLTD: 8/19/	91
METHOD: HSA		CASE SIZE: 2 inch		SCREEN INT. 4' to 14		PROT	ECTION LEVEL: D	
TOC ELEV.: 97.51 (assumed)	FT.	MONITOR INST.: OVA	1	TOT DPTH: 14F	т.	DPTH	TO ¥ 3.00 FT.	
LOGGED BY: B. Stevens		WELL DEVELOPMENT	DATE: 8/	(18/91		SITE	: NTC Orlando	
DEPTH CAMPLE TO SAMPLE SAMPLE SAMPLE TO SAMPLE	HEADSPACE (ppm)	SOIL/ROCK	DESCRIPT	101	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WEILL DATA
5—	S.A.	AND: Dark brown,with soledium grain. AND: Grey fine to medium and the soledium grain.		silty, fine to		SM		
		PAGE	<u> 1 of Ol</u>	_D19ABE	B ENVIRO	MENT	TAL SERVICES.	INC.

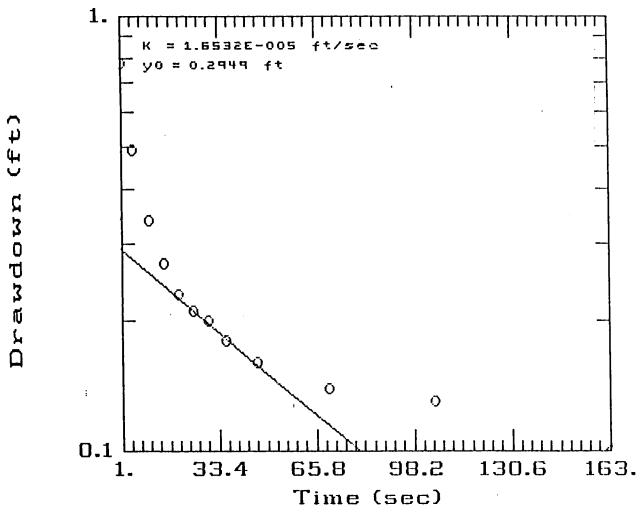
TITLE: NTC ORLANDO, McCOY ANN	EX, BUILDING 7174		<u> </u>	BORING NO.	NΑ	
CLIENT: U.S. NAVY, SOUTHNAVFAC				PROJECT N		
CONTRACTOR: GROUNDWATER PROT	ECTION, INC.	DATE STARTED: 7-	-12-96	COME	PLTD: 7-12-	<u>9</u> 6
METHOD: 4.25-INCH ID HSA	CASE SIZE: 2-INCH	SCREEN INT: 4-14	FEET	PROTECTIO	V LEVEL: I) .
TOC ELEV: NM FEET.	MONITOR INST: OVA	TOT DPTH: 14 FEE	T	DPTH TO Z	Z 6 FEET.	
LOGGED BY: S. DONELICK	WELL DEVELOPMENT DATE	E: 7-12-96		SITE: BUIL	DING 7174	
DEPTH FT. TS. GI ANDRE SAMPLE SAMPLE RECOVERY HEADSPACE (ppm)	SOIL/ROCK DESCRIPTI AND COMMENTS	10N C C C C C C C C C C C C C C C C C C C		SOUL CLASS	/S/6-IN	WELL DAIA
	Sand, fine grained, some o brown, no odor	clay,		SP	2. XXXX	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
	Sand, fine grained, with g	navel fill,		SP		
5 —	gray to brown, no odor Sand, fine grained, gray t	. o brown		SP		
	saturated, some gravel t below land surface, moder petroleum odor	o 9 feet				
10 —						
15	PAGE 1 OF OLD7174-2	O ABB	ENVIRD	INMENTAL S	SERVICES,	INC.

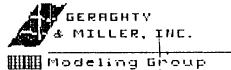
TITLE: NTC ORLANDO, McCOY ANN	EX, BUILDING 7174 LDG OF	WELL: OLD7174-	-21	BORING NG. NA	
CLIENT: U.S. NAVY, SOUTHNAVFAC	ENGCOM			PROJECT NO: 8519.42	
CONTRACTOR: GROUNDWATER PROT	ECTION, INC.	DATE STARTED:	7-12-96	COMPLID	7-12-96
METHOD: 4.25-INCH ID HSA	CASE SIZE: 2-INCH	SCREEN INT: 4-1	4 FEET	PROTECTION LO	IVEL: D
TOC ELEV. NM FEET.	C ELEV.: NM FEET. MONITOR INST:: OVA TOT DPTH: 14 FEET DPTH TO \$\frac{1}{2}\$ 6				FEET.
LOGGED BY: S. DONELICK	WELL DEVELOPMENT DATE	E: 7-12-96		SITE: BUILDING	7174
DEPTH FT SAMPLE SAMPLE COVERY HEADSPACE (ppm)	SOIL/ROCK DESCRIPTI AND COMMENTS	ΠN	LITHOLOGIC SYMBOLS	Brows/e-	ZZ WELL DATA
	Asphalt, 2-inch clayey sa roots, black, organic, slig	nd with many ht odor		SP	
5 —	Sand, fine grained, brown, moist	no odor,		SP	
8	Sand, fine grained, brown, saturated	no ador,		SP	
10 —					
15	PAGE 1 OF OLD7174-2	1 ABB EI	NVIRONM	IENTAL SERVICE	ES, INC.

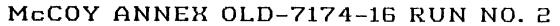
TITLE: NTC ORLANDO, McCOY ANN	EX, BUILDING 7174	WELL: DLD7174-	22	BORIN	 G NO. NA	
CLIENT: U.S. NAVY, SOUTHNAVFAC				PROJE	CT ND: 8519	9.42
CONTRACTOR: GROUNDWATER PROT	ECTION, INC.	DATE STARTED: 7	7-12-96	,	COMPLID: 7	-12-96
METHOD: 4.25-INCH ID HSA	CASE SIZE: 2-INCH	SCREEN INT: 4-1	4 FEET	PROTE	CTION LEVE	IL: D ·
TOC ELEV: NM FEET.	MONITOR INST: OVA	TOT DPTH: 14 FE	ET	DPTH	TO ₹ 6 FE	ET.
LOGGED BY: S. DONELICK	WELL DEVELOPMENT DATE			·	BUILDING 7	174
DEPTH FT. T. SAMPLE SAMPLE SAMPLE RECOVERY HEADSPACE (ppm)	SOIL/ROCK DESCRIPTI AND COMMENTS	ON	LITHOLOGIC SYMBOLS	SOIL CLASS	BLOWS/6-IN	WELL DATA
	Asphalt, 2-inch clayey sa roots, black, organic, slig	nd with many ht odor		SP		
5 —	Sand, fine grained, brown, moist	no odor,		SP		
	Sand, fine grained, brown, saturated	no odor,		SP		-
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15	PAGE 1 OF OLD7174-2	2 ABB EN	VIRONM	ENTAL	SERVICES,	INC.

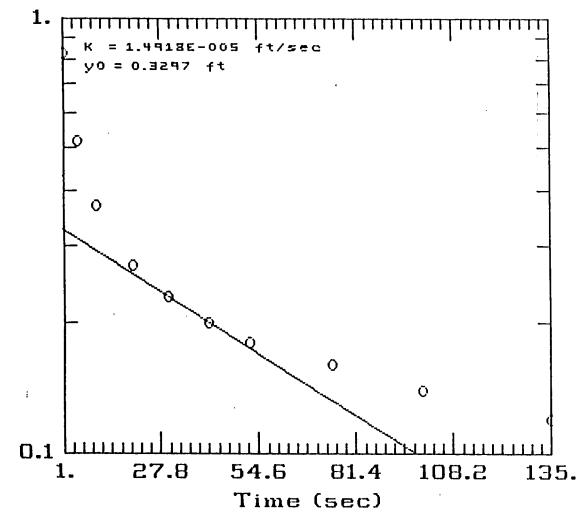
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CLIENT: U.S. NAVY, SOUTHNAVFACE	ENGCOM			PROJE	CT NO: 8519	.42
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METHOD: 4.25-INCH ID HSA	CASE SIZE: 2-INCH	SCREEN INT. 4-1	4 FEET	PROTE	CTION LEVE	L: D
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	WELL DEVELOPMENT DATE	E: 7-12-96			BUILDING 71	74
DEPTH FT. SAMPLE ANDLESSERY RECOVERY (PPM)	SOIL/ROCK DESCRIPTI AND COMMENTS	ΠN	LITHOLOGIC SYMBOLS	SOIL CLASS	BLOWS/6-IN	WELL DATA
	Sand, some clay, fine grai brown, no odor, moist	ned,		SP		
5 —	Sand, some clay, fine grain black, no odor, moist	ned,		SP		
	Sand, some clay, fine grain slight organic odor, satur	ned, ^ated		SP		
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15	PAGE 1 OF OLD7174-2	3 ABB E	NVIRON	MENTAL_	SERVICES,	INC.

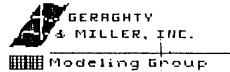
APPENDIX E AQUIFER TEST DATA



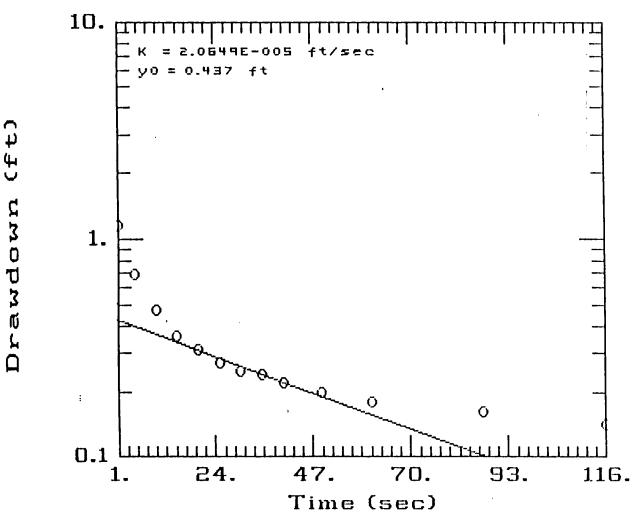


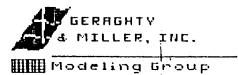




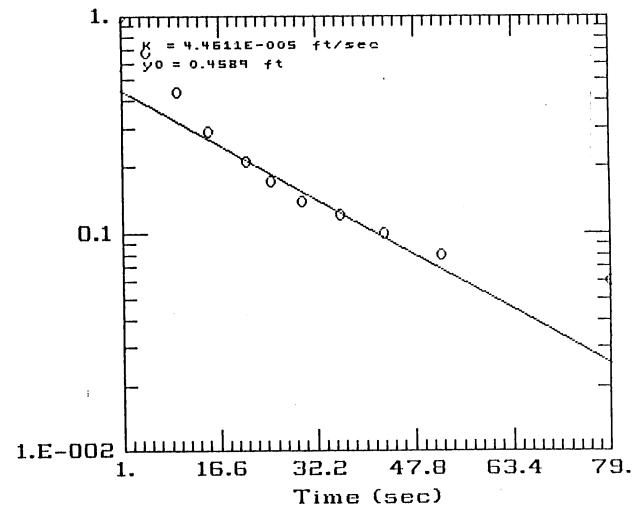


McCOY ANNEX OLD-7174-16 RUN NO. 3

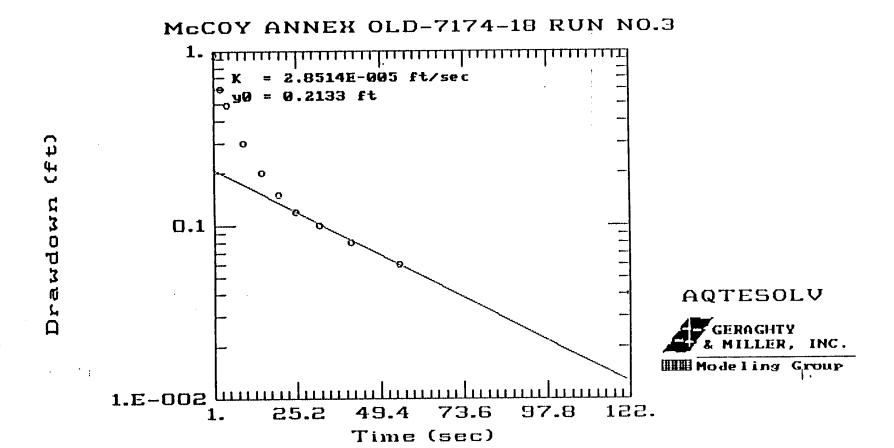


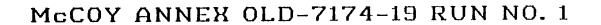


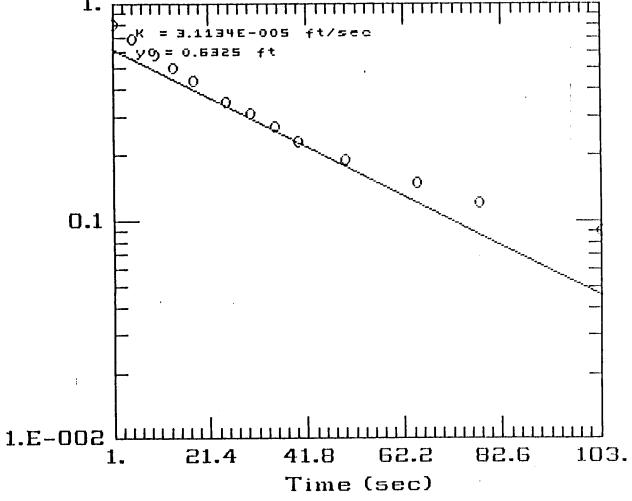
McCOY ANNEX OLD-7174-18 RUN NO. 2





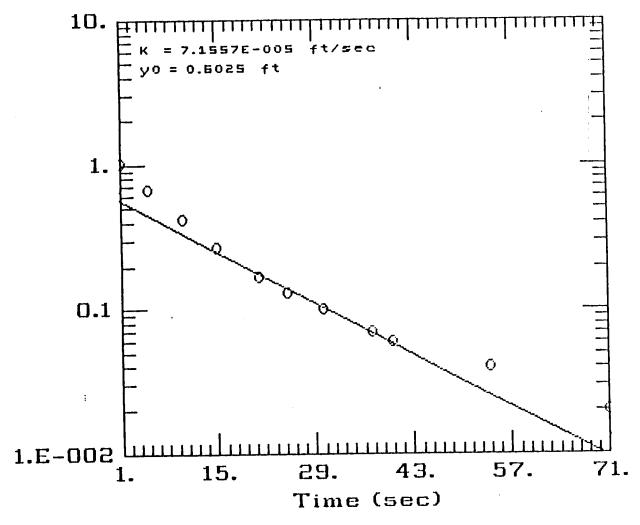


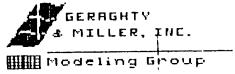


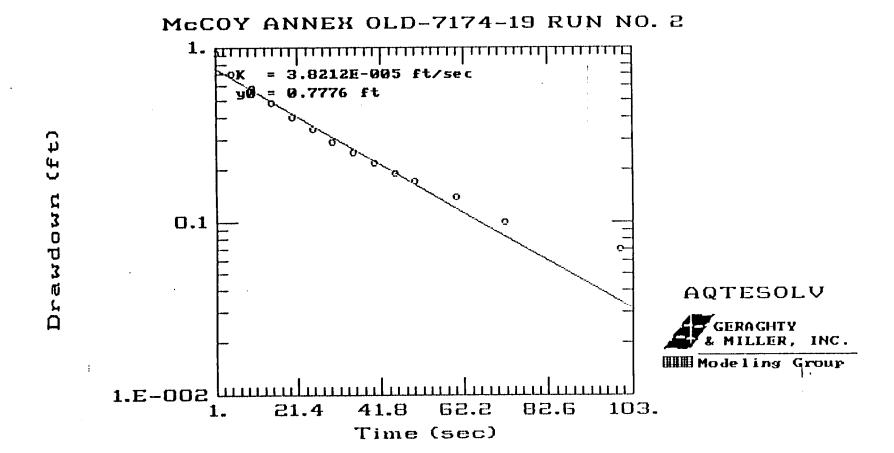




McCOY ANNEX OLD-7174-18 RUN NO. 1









TANK CLOSURE ASSESSMENT AND INITIAL REMEDIAL ACTION REPORT



27 February, 1995

Doc. No. 08519-42-001

Mr. Mark Zill Commanding Officer, Code 010E 1350 Grace Hopper Ave. Orlando, Florida 32813-8405

SUBJECT: Closure Assessment Form for McCoy Annex Site 7174

Dear Mark:

Enclosed is the Closure Assessment Form for the four 10,000 gallon underground storage tanks which were removed from the McCoy Annex Base Exchange Service Station on December 31, 1994 and January 3, 1995. Also enclosed is a site map and a copy of receipts showing quantity of excessively contaminated soil which was transported to the disposal facility. Note that groundwater samples are not included as remedial actions for the existing soil and groundwater contamination will begin during the second quarter of this year. Please obtain the proper signature of owner and forward this form to the Florida Department of Environmental Protection central regulating district office. A copy should also be sent to the Environmental Department of Orange County.

Should you have any questions, or if additional information is required, please contact me at your earliest convenience.

Very truly yours,

ABB ENVIRONMENTAL SERVICES, INC.

Mark C. Diblin, P.G. Senior Task Order Manager

F. Joseph Ullo, Jr. Project Engineer

Enclosures

cc: File

ABB Environmental Services Inc.



Florida Department of Environmental Regulation

Twin Towers Office Bidg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

DER form # 17-761 900/61	<u> </u>
Form Tax Closure Assessment Form	
Electric Date Decomber 10, 1990	
DER Approximen No	_

Closure Assessment Form

Owners of storage tank systems that are replacing, removing or closing in place storage tanks shall use this form to demonstrate that a storage system closure assessment was performed in accordance with Rule 17-761 or 17-762, Florida Administrative Code. Eligible Early Detection Incentive (EDI) and Reimbursement Program sites do not have to perform a closure assessment.

Please Print or Type Complete All Applicable Blanks

		_	
1.	Date:	Janua	12 1995
2.	DER Fa	cility ID N	mber: 4888 40202 3. County: Orange
4.	Facility I	Name:	McCoy Annex, Building 7174, NEX Service Station
5.	Facility (Owner:	U.S. Navy
6.	Facility /	Address: _	McCoy Annex Building 7174
		Address: .	·
8.	Telephor	ne Numbe	9. Facility Operator:
10.	Are the	Storage T	nk(s): (Circle one or both) A. Aboveground or (B) Underground
11.	Type of	Product(s)	Stored: Unleaded yasoline and diesel
			(Circle one) A. Replaced (B) Removed C. Closed in Place D. Upgraded (aboveground tanks only)
13	Number	of Tanks	Closed: 4 14. Age of Tanks: 9 years
			<u> </u>
	,		Facility Assessment Information
		B	•
Yes	No	Not Applicable	
	\boxtimes		1. Is the facility participating in the Florida Petroleum Liability Insurance and Restoration Program (FPLIRP)?
$\overline{\mathbf{X}}$			2. Was a Discharge Reporting Form submitted to the Department? Where Orange Causty Favican medial Protection
X			If yes, When: 9-6-94 Where: Orange County Environmental Protection 3. Is the depth to ground water less than 20 feet? FDEP Central District
区区			4. Are monitoring wells present around the storage system?
	$\overline{}$		If yes, specify type: Water monitoring Vapor monitoring
区	H	H	5. Is there free product present in the monitoring wells or within the excavation?6. Were the petroleum hydrocarbon vapor levels in the soils greater than 500 parts per million for gasoline?
<u>د</u>			Specify sample type: Vapor Monitoring wells Soil sample(s)
X			7. Were the petroleum hydrocarbon vapor levels in the soils greater than 50 parts per million for diesel/kerosene?
			Specify sample type: Vapor Monitoring wells Soil sample(s)
			the state among the state that the state that the state to reat leader
X			8. Were the analytical laboratory results of the ground water sample(s) greater than the allowable state target levels?
			8. Were the analytical laboratory results of the ground water sample(s) greater than the allowable state target levels? (See target levels on reverse side of this form and supply laboratory data sheets)9. If a used oil storage system, did a visual inspection detect any discolored soil indicating a release?
			8. Were the analytical laboratory results of the ground water sample(s) greater than the allowable state target levels? (See target levels on reverse side of this form and supply laboratory data sheets)

Bechtel

Oak Ridge Corporate Center 151 Lafayette Drive P.O. Box 350 Oak Ridge, Tennessee 37831-0350

Facsimile: (615) 220-2100

February 6, 1995

Joe Ullo
ABB Environmental Services
Berkeley Building
2590 Executive Center Circle East
Tallahassee, FL 32301

Dear Mr. Ullo,:

Enclosed for your use are the receipts showing quantities of materials transported to the disposal facility from 7174. The first page lists the quantities from the receipts; some of the numbers on the receipts are difficult to read.

Should you have any questions concerning this package, please call Tom Conrad at (615) 220-2205.

Sincerely,

O. N. McNeil Project Manager

O. N. M. Neilh

KKL:pw:6\LR0001

cc: Luis Vazquez, w/o Steve Smith, w/o Kurt Musser, w/o

ACTION REQ'D [] YES NO DATE ______RESPONSE TO CHRON NO:



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NON-HAZARDOUS PETROLEUM CONTAMINATED SOIL RECEIVING MANIFEST

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10 210702 100P #15 2:11PM 82000 1b TM	Job# TRANSPORTER CERTIFICATION
10 12004 1-10-99 2×4-998	I hereby declare that the contents of this con- signment are the exact same as loaded on my vehicle at the site referenced above. Additionally,
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53400 Th NT	/ TONS :
TRANSPORTER'S NAME (PRONTED)	SIGNATURE SIGNATURE

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•	Billing	
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1-10-95 5131FH	vehicle at the site refere	enced above. Additionally,
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TREATMENT SERVICES inc.

NON-HAZARDOUS PETROLEUM CONTAMINATED SOIL RECEIVING MANIFEST

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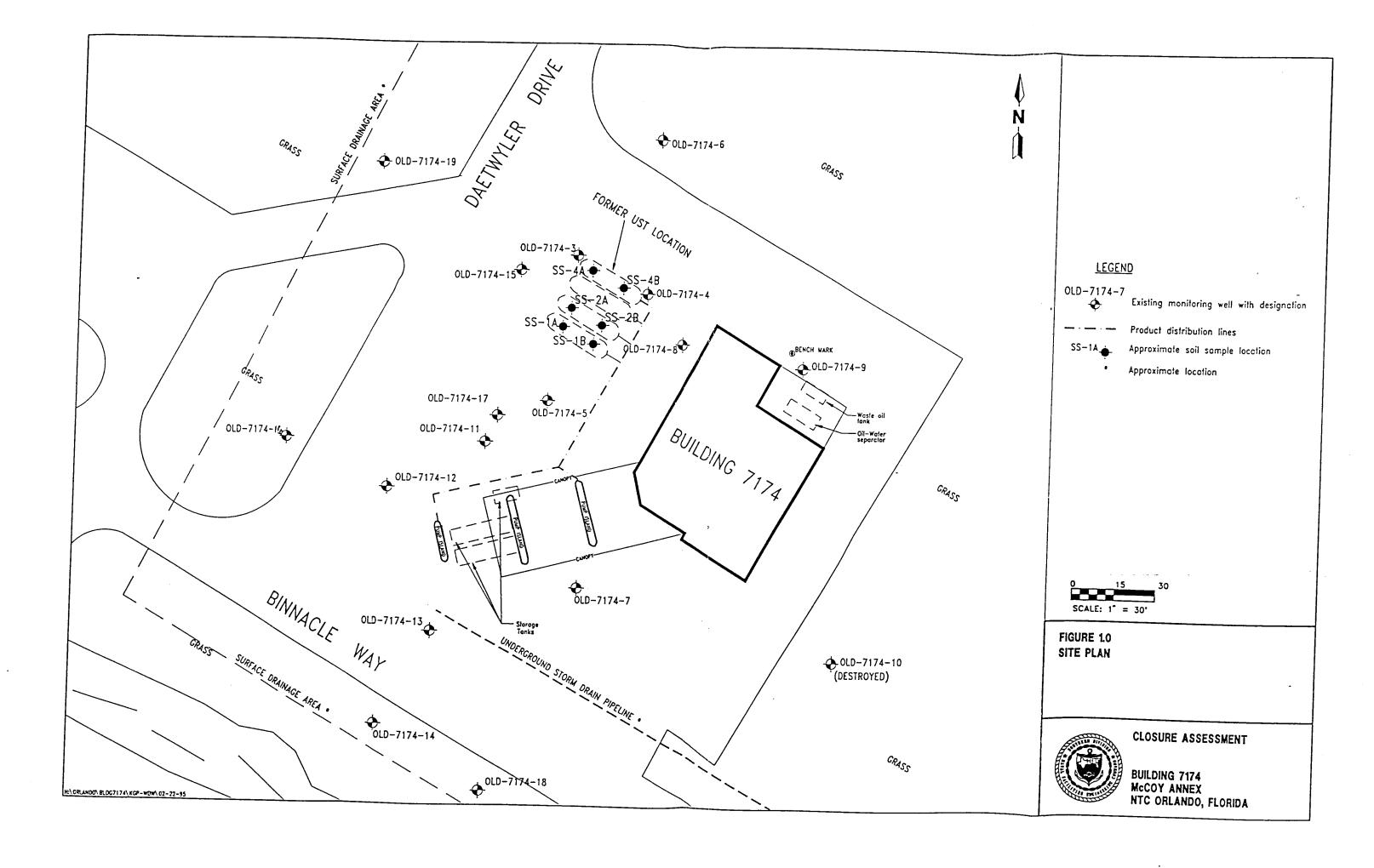
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APPENDIX G TECHNICAL MEMORANDUM McCOY ANNEX



October 25, 1995

Doc No.: 08519.331

Commanding Officer
Southern Division
Attn: Mr. Nick Ugolini, Code 1843
Naval Facilities Engineering Command
P.O. Box 10068
2155 Eagle Drive
North Charleston, SC 29411-0068

Subject:

Technical Memorandum, McCoy Annex Site 7174

CTO 107, Contract No. N62467-89-D-0317

Dear Nick:

Please find enclosed two copies of the subject Technical Memorandum for your review. Based on your desire for a low cost, quick review of Site 7174, the copies have not been bound or sent to other groups. Should you want additional bound copies sent to other entities such as FDEP or Bechtel, please let us know. We would suggest that a copy be provided to Mr. Wayne Hansel.

Based on this report, the required area of excavation is fairly large. We recommend that the desire to excavate now, be tempered with the overall plans for McCoy Site 7174 and the knowledge that a complete CAR and RAP will still be required based on FDEP's letter of July 5, 1995.

Should you have any questions regarding this letter or the contents of the Technical Memorandum, please call Mirna Barq or myself at (407) 895-8845.

Very Truly Yours,

ABB Environmental Services, Inc.

John P. Kaiser

Principal Project Manager

JPK/lak Enclosures

cc:

M. Barq (ABB-ES) w/out enclosure

D. Scarborough (ABB-ES) w/out enclosure

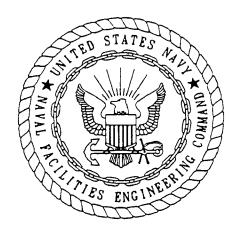
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FILE COPY



TECHNICAL MEMORANDUM

MCCOY ANNEX SITE 7174

NAVAL TRAINING CENTER ORLANDO, FLORIDA

UNIT IDENTIFICATION CODE: N65928 CONTRACT NO. N62467-89-D-0317/107

OCTOBER 1995



SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND NORTH CHARLESTON, SOUTH CAROLINA 29419-9010

TECHNICAL MEMORANDUM

MCCOY ANNEX SITE 7174 NAVAL TRAINING CENTER ORLANDO, FLORIDA

Unit Identification Code: N65928

Contract No. N62467-89-D-0317/107

Prepared by:

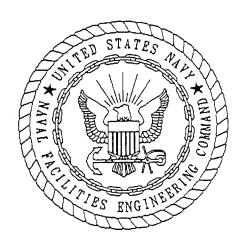
ABB Environmental Services, Inc. 2590 Executive Center Circle, East Tallahassee, Florida 32301

Prepared for:

Department of the Navy, Southern Division Naval Facilities Engineering Command 2155 Eagle Drive North Charleston, South Carolina 29418

Nick Ugolini, Code 1843, Engineer-in-Charge

October 1995



CERTIFICATION OF TECHNICAL DATA CONFORMITY (MAY 1987)

The Contractor, ABB Environmental Services, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/107 are complete and accurate and comply with all requirements of this contract.

DATE:	October	<u>24,</u>	1995		

NAME AND TITLE OF CERTIFYING OFFICIAL:

John Kaiser

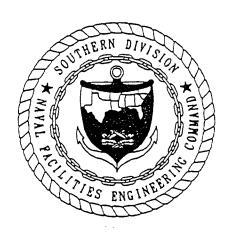
Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL:

Mirna Barq

Project Technical Lead

(DFAR 252.227-7036)



FOREWORD

Subtitle I of the Hazardous and Solid Waste Amendments (HSWA) of 1984 to the Solid Waste Disposal Act (SWDA) of 1965 established a national regulatory program for managing underground storage tanks (USTs) containing hazardous materials, especially petroleum products. Hazardous wastes stored in USTs were already regulated under the Resource Conservation and Recovery Act (RCRA) of 1976, which was also an amendment to SWDA. Subtitle I requires that the U.S. Environmental Protection Agency (USEPA) promulgate UST regulations. The program was designed to be administered by individual States, who were allowed to develop more stringent, but not less stringent standards. Local governments were permitted to establish regulatory programs and standards that are more stringent, but not less stringent than either State or Federal regulations. The USEPA UST regulations are found in the Code of Federal Regulations (CFR), Title 40, Part 280 (40 CFR 280) (Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks) and 40 CFR 281 (Approval of State Underground Storage Tank Programs). 40 CFR 280 was revised and published on September 23, 1988, and became effective December 22, 1988. The Navy's UST program policy is to comply with all Federal, State, and local regulations pertaining to USTs.

Questions regarding this report should be addressed to the Commanding Officer, Naval Training Center (NTC), Orlando, Florida, or to Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), Code 18237, at AUTOVON 563-0528 or 803-743-0528.

EXECUTIVE SUMMARY

On October 4 and 5, 35 additional soil borings were installed at 7174 to completely access the horizontal and vertical soil contamination plume. The approximate volume of the plume is now 5,025 cubic yards. Since late June 1995, the plume has traveled further to the south and east and requires better definition in order to quickly evaluate soil excavation as a remedial option.

Alternatives for the remediation of petroleum hydrocarbon-contaminated soil and groundwater at the 7174 McCoy Annex site have been evaluated. The evaluation methodology was generally based on effectiveness, feasibility, and cost comparison between the excavation-incineration and soil vapor extraction [SVE] options is shown on Attachments A & B).

SVE in conjunction with groundwater recovery systems is the most effective option. In this option, soil vapor could be extracted through screening above the groundwater table in the groundwater recovery wells or in a separate SVE recovery well. The extracted soil vapors would be passed through carbon filters to remove the hydrocarbon contamination.

It is recommended that the contaminated groundwater be remediated using a pumpand-treat system. The system includes groundwater recovery wells, an air stripper, and discharge to the stormwater system. (As recommended by the original remedial action plan [RAP] and RAP Addenda 1 & 2.)

TABLE OF CONTENTS

Technical Memorandum McCoy Annex, Site 7174 Naval Training Center Orlando, Florida

Chap	ter	Tj	tl	<u>e_</u>					 	 							Pa	age No.
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4.0	CONC	LUSIONS AND RECOMMENDATIONS .																4-1

ATTACHMENTS

Attachment A: Contaminated Soil Volume Calculation

Attachment B: Soil Treatment Evaluation

GLOSSARY

ABB-ES ABB Environmental Services, Inc.

IRA initial remedial action

ppm parts per million

RAP remedial action plan

SOUTHNAV-

FACENGCOM Southern Division, Naval Facilities Engineering Command

1.0 INTRODUCTION

This report has been prepared at the request of Nick Ugolini of Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to review the feasibility of performing an Initial Remedial Action (IRA), to remove contaminated soil while the Remedial Action Contract contractor is onsite implementing the Tank Management Plan.

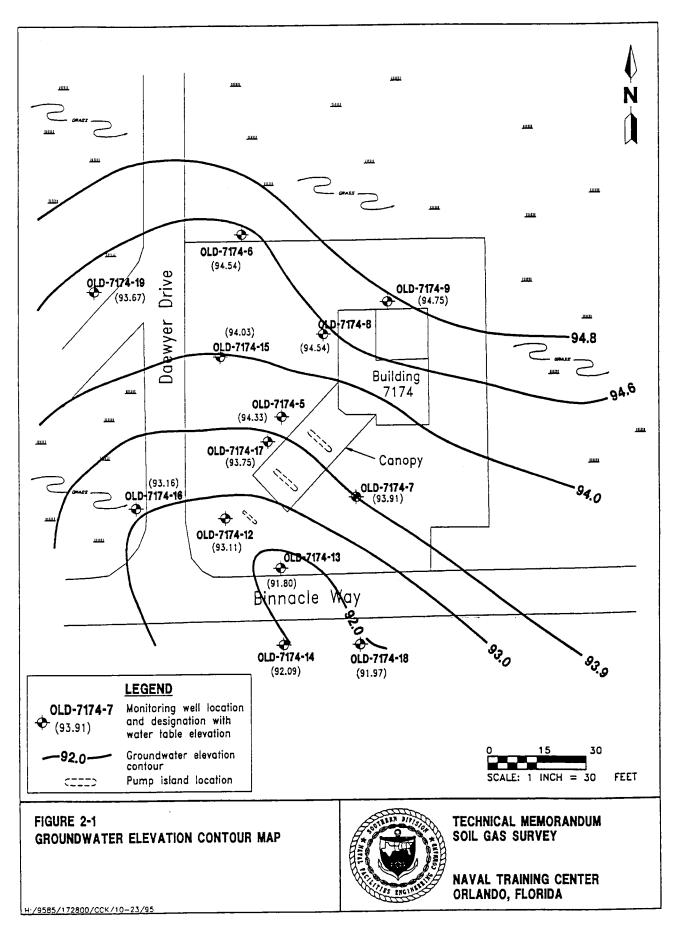
1.1 SITE LOCATION AND BACKGROUND INFORMATION. Site 7174 is the McCoy Annex Base Exchange Service Station located at the corner of Daetwyler Drive and Binnacle This site has gasoline tanks which were in use from 1942 to 1994. during a routine sampling of 1988 Contamination was first detected in compliance wells located on the site. A preliminary contamination assessment was performed later that same year by E.C. Jordan which confirmed the presence of groundwater contamination as well as established the possible point of release as the improperly sealed annuli around the tank fill ports. In late June 1991 a contamination assessment was performed which reconfirmed water contamination and confirmed the presence of soil contamination. In April of 1993 a Remedial Action Plan (RAP) was designed by implementation of a pump-and-treat system in conjunction with an air stripper to reduce the groundwater contamination and a soil vapor extraction system to reduce soil contamination. A RAP addendum was performed by OHM Corporation in May of that same year, which coincided with ABB Environmental Services, Inc. (ABB-ES) findings, except for a few minor adjustments. Another RAP addendum was completed by ABB-ES in March 1995, which once again only offered minor adjustments to the previously recommended method of remediation.

1.2 SCOPE OF WORK. The following describes the scope of work performed by ABB-ES during this RAP.

- Confirmation of groundwater flow direction
- Performance of a soil assessment in order to delineate the vertical and horizontal extract of the soil contamination.
- Comparison of cost and feasibility between an IRA and other remedial alternatives.
- Preparation of this report describing all field activities, all remedial options and ABB-ES recommendations

2.0 FIELD ACTIVITIES

- 2.1 GROUNDWATER FLOW DIRECTION. The water at the site was measured in October 1995 at a depth between 5 and 6 feet below grade. The occurrence of groundwater at the site represents the surface of the unconfined water table aquifer. Fluctuation in water table elevations may range from 2 to 3 feet with variations with seasonal precipitation. The direction of groundwater flow as determined from water level measurements obtained on October 29, 1995, is generally to the southeast toward an existing ditch. The October 1995 water level elevation dates are summarized in Table 2-1 and presented on Figure 2-1.
- 2.2 SOIL ASSESSMENT. In April 1995, soil assessment activities were conducted at the subject site in order to determine the approximate area contaminated by the petroleum product and delineate the boundary of the existing plume. On October 4 and 5, additional soil assessments, which consisted of 35 soil borings, were conducted in order to delineate the southern and eastern boundaries of the existing plume due to the groundwater flow toward that direction (Figure 2-2). Soil samples were collected at 3 and 5 feet below land surface (Figure 2-3) and were analyzed for the presence of organic vapor concentration using Healthtech porter FID II organic vapor analyzer. The water table was encountered at a depth of 5 to 7 feet below land surface during this soil assessment. The results of the organic vapor analysis are summarized in Table 2-2.
- $\underline{2.3}$ FINDINGS. According to the soil assessed on October 4 and 5, 1995, a large soil plume was identified and located toward the southeast area of site 7174.



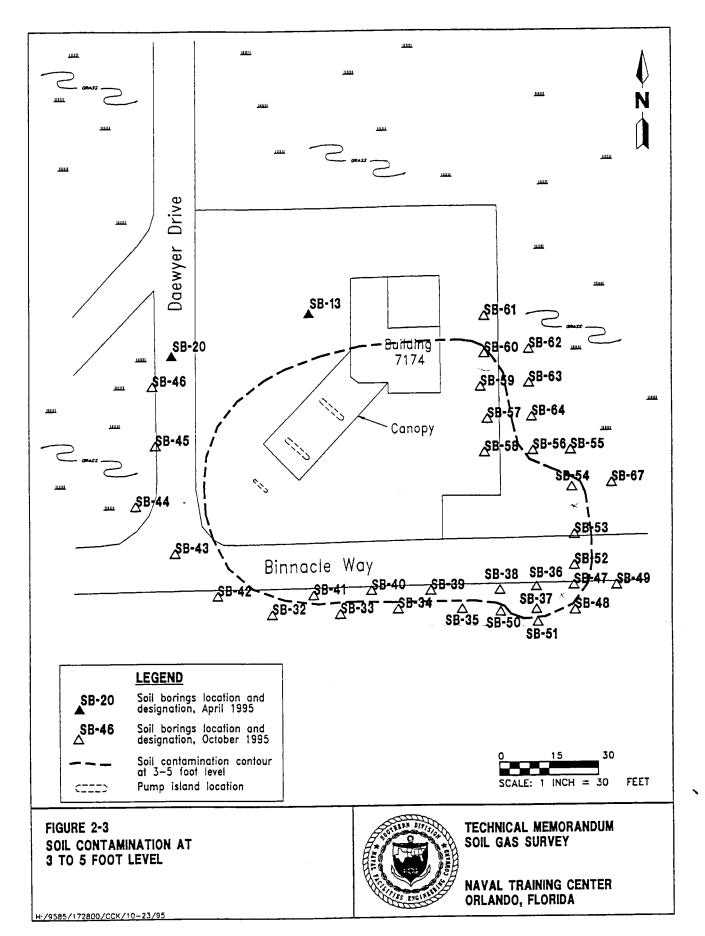


Table 2-2 (Continued) Soil Boring Field Data Summary

Technical Memorandum McCoy Annex, Site 7174 Naval Training Center Orlando, Florida

	Data		Depth (ft) 1 to 3			Depth (ft)		
Location	Date	Filtered	Unfiltered	TRH	Filtered	Unfiltered	TRH	Water Table Depth
SB-55	10-05-95	0	0	0	40	0	40	•••
SB-56	10-05-95	0	0	O	0	0	0	
SB-57	10-05-95	0	0	0	1,100	65	1,035	***
SB-58	10-05-95	1,750	100	1,650	1,100	35	1,065	
SB-59	10-05-95	1,000	35	965	1,600	35	1,565	•
SB-60	10-05-95	400	30	370	350	12	338	
SB-61	10-05-95	0	0	0	0	0	0	
SB-62	10-05-95	0	0	0	0	0	0	
SB-63	10-05-95	0	0	0	0	0	0	
SB-64	10-05-95	0	0	0	0	0	0	
SB-65	10-05-95	2	0	2	0	0	0	

Notes: ft = feet.

TRH = total recoverable hydrocarbons.

--- = not measured.

3.0 SOIL REMEDIATION ALTERNATIVES

- 3.1 INTRODUCTION TO TECHNOLOGIES. Soil remediation technologies comprised two treatment methods: in situ and ex situ. In situ technologies consist of remediation of the soil in its original location with no excavation. Ex situ technologies require excavation and onsite treatment at a location separate from the excavation. A combination of technologies into an integrated treatment system will be the choice of the future as innovative technologies are applied to contaminated waste sites.
- 3.2 IN SITU TECHNOLOGIES. Typical in situ technologies are containment, volatilization, bioremediation, soil leaching, and verification. Soil venting is the most common in situ soil treatment method used to remediate soil contaminated with volatile contaminants such as petroleum hydrocarbons and solvents. This technology generally consists of "vacuuming" contaminated soil gases from the unsaturated soil zone through air-extraction wells using vacuum pumps. Negative pressure induced by the vacuum pump draws soil gases through the soil pore spaces. Air-inlet or air-injection wells can be used to facilitate air flow into the soil to replace the extracted soil gas. Volatilization of the contaminant and soil permeability are critical factors in soil venting technology.

Bioremediation may be a suitable remedial alternative depending onsite conditions. This technology generally consists of supplying oxygen and nutrients for aerobic bacteria. These bacteria are naturally occurring and indigenous to the site. The chemicals or nutrients are carefully introduced and controlled to maintain optimum conditions for the bacteria to thrive. Aerobic degradation is preferred because the rate of degradation is much higher for aerobic processes as compared to anaerobic processes. The soil permeability and the ability to disperse the nutrients throughout the contaminated soil are critical to this method.

3.3 EX SITU TECHNOLOGIES. Typical ex situ technologies are containment, heap volatilization, heap bioremediation, soil washing, composting, low temperature volatilization, high temperature thermal, chemical extraction, and solidification-stabilization-chemical fixation. The traditional excavation method is typically the most feasible for small volumes of contaminated soil. However, for larger quantities, onsite treatment is more attractive because the groundwater contamination source is quickly removed and the contamination addressed. Heap pile soil venting, bioremediation, composting, and solidification-stabilization-chemical fixation methods are typically utilized.

Chemical fixation technologies to solidify and stabilize contaminated soil generally utilize binding agents such as cement, lime, and pozzolans, and fixation agents such as sodium silicates to encapsulate the contamination such that the finished process will meet toxicity characteristic leachate procedure criteria. Chemical fixation is suitable for inorganic and organic contaminants. Heavy metal contamination has been successfully remediated using chemical fixatives and allowed to solidify. The treated soil is allowed to cure prior to disposal. Performance of a treatability test to demonstrate that the fixation process performs to specifications is recommended.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Excavating this site would not provide the most cost-effective treatment of petroleum-impacted soil. The excavation would have a high cost impact on the remediation project due to the demolition of the service station structure along with the surrounding asphalt and pavement parking lot and nearby roadway; excavation of the contaminated soil, treatment, backfill and compaction; and restoration of the affected roadway and utilities. Furthermore, this procedure would not address the groundwater contamination, which must be done per State regulation 620770, Florida Administrative Code.

According to the Guideline for Assessment and Remediation of Petroleum Contaminated Soil per Florida Department of Environmental Protection, 1992, soil with vapor readings as low as 10 ppm should be considered contaminated, and some judgement should be exercised when determining the assessment endpoint. The appropriate endpoint will be site specific, but one between 10 and 100 ppm generally should be acceptable. ABB-ES recommends that soil which exhibits organic vapor greater than 50 ppm should be considered excessively contaminated.

Due to the size of the new plume and the direction of the groundwater flow, it is recommended to remediate The excessively contaminated soil at this site in situ by a soil vapor extraction. This is a proven technology and will achieve the RAP objectives with a minimum disruption of the Binnacle Way with a reasonable cost.

ATTACHMENT A CONTAMINATED SOIL VOLUME CALCULATION

CONTAMINATED SOIL VOLUME CALCULATIONS

PROJECT;

7174 McCOY ANNEX

ABB-ES PROJECT #:

08519-42

VOLUME OF EXCESSIVELY CONTAMINATED SOIL = 5,026 yd3

The soil volume calculations are based on measuring the thickness of the contaminated soil above the water table and using the thickness as the contours for the areas of the excessively contaminated soil as shown on the Isopach map (Figures 2 and 3).

INCREMENTAL THICKNESS:

2 FEET

	AVERAGE INCREMENTAL CUMULATIVE							
THICKNESS (ft)	AREA (ft²)	AREA (ft²)	VOLUME (ft ³)	7VOLUME (ft³)				
0.0	43,750.0							
3.0	32,150.0	37,950.0	75,900.0	75,900.0				
5.0	27,650.0	29,900.0	59,800.0	135,700.0				

Notes: $yd^3 = cubic yards$.

ft = foot.

 ft^2 = square feet.

ft³ = cubic feet.

ATTACHMENT B SOIL TREATMENT EVALUATION

SOIL TREATMENT EVALUATION

PROJECT;

7174 McCOY ANNEX

ABB-ES PROJECT #:

08519-42

SITE DATA	Units	Value
Depth to High Water Table	feet	5.0
Type of Contaminant		Gasoline Fuel
Volume of Excessively Contaminated Soil	γď³	5,026
Density of Soil	ton/yd³	1.5
Number of Tons for Transport and Disposal	ton	7,539
Maximum Concentrations	ppm	3,000
Type of Site Cover		Concrete/Asphalt

SITE CONSTRAINTS	
Excessively contaminated soil near aboveground structures? Excessively contaminated soil around or near underground facilities? Will excavation disrupt business operations?	Yes, Canopy Yes, Tanks and Roads No

SOIL CLEANUP LEVELS

Per 17-775, reduce concentration levels to:

VOA - 100 ppb and TRPH 10 ppm

TRPH - 50 ppm, PAH - 6 ppm, and VOH - 50 ppb

(Test with OVA per Chapter 17-770 Headspace Procedures Prior to Sampling for Above Tests-OVA readings must be less than excessively contaminated soil limits)

	ESTIMATED TRE	ATMENT COST	S	
ITEM	UNITS	QUANTITY	COST/UNIT	COST
SOIL EXCAVATION				
Concrete Removal and Disposal	yd³	223	\$18.50	\$4,125.50
Asphalt Removal and Disposal	yd²	5,527	10.00	55,270.00
Shoring of Excavation	lin.ft.	300	50.00	15,000.00
Excavation and Loading Cost	ton	7,539	3.50	26,386.50
Preburn Analytical Cost	sample	4	375.00	1,500.00
Site Supervisor	hour	16	50.00	800.00
OVA Rental	day	2	150.00	300.00
Transportation Cost	ton	7,539	8.00	60,312.00
Treatment and Disposal Cost	ton	7,539	44.00	331,716.00
Backfilling	yd ³	5,026	6.25	31,412.50
Concrete Replacement	yd³	223	104.00	23,192.00
Asphalt Replacement	yd²	5,527	19.00	105,013.00
Soil Replacement	yd²	0	3.00	0.00
Canopy Removal and Disposal	lump sum	1	5,000.00	5,000.00
• •	d Cost for Soil E	xcavation:	_	\$660,027.50

Note: All clean soil excavated from ground surface to 5 feet bls will be returned to the excavation.

APPENDIX H GROUNDWATER LABORATORY ANALYTICAL REPORTS



Mr. John Kaiser ABB Environmental Services 1080 Woodcock Road Suite 100 Orlando, FL 32803

RE: Analytical Data for

ABB UST 527

OAL Reference

Dear Mr. John Kaiser:

On **July 25, 1996**, QAL, Inc. received samples with a request for analysis. The analytical results and associated quality control data are enclosed.

It is our policy to store your samples for 30 days from the date of this letter. If extended storage is required, special arrangements can be accommodated upon early notification. The disposition of samples identified as hazardous will require special handling and you will be contacted if necessary.

QAL, Inc. appreciates your business and looks forward to serving you again. If you have any questions concerning your report or need any additional information, please call me at (334) 271-2440.

Sincerely,

Spencer Hamil

Project Manager/Client Services

Enclosures

xc: Mr. Manuel Alonzo

Mr. John McVoy

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GC E	XTRACTABLE Case narra Sample res	tive			•	•	•	•	٠.	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•		55 56 58
GC P	OLYNUCLEAR Case narra Sample res	tive			•	•	•	•	•	•	•		•		•	•	•	•	•	•	•	•	•	•	•	•	•		81 82 84
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	RAL CHEMIST Case narra Sample res	tive ults	• •	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		133 134 135
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Organic Data Qualifiers

- A -- This qualifier indicates that a TIC is a suspected aldol-condensation product.
- B -- This flag is used when the analyte is found in the associated blank as well as the sample. This notation indicates possible blank contamination and suggests that the data user evaluate these compounds and their amounts carefully.
- C -- The "C" flag indicates the presence of this compound has been confirmed by GC/MS analysis.
- D -- This qualifier is used for all compounds identified in an analysis at a secondary dilution factor. "D" qualifiers are used only for the samples reported at more than one dilution factor.
- E -- This flag indicates that the value reported exceeds the linear calibration range for that compound. Therefore, the sample should be reanalyzed at an appropriate dilution. The "E" qualified amount is an estimated concentration, and the results of the dilution will be reported on a separate Form I.
- I -- This qualifier indicates that the reporting limit adjacent to the "I" qualifier has been raised. It is used when chromatographic interference prohibits detection of a compound at a level below the concentration expressed on the Form I.
- J -- Indicates an estimated value. It is used when the data indicates the presence of a target compound below the reporting limit or the presence of a Tentatively Identified Compound (TIC).
- N -- This qualifier indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the "N" qualifier is not used.
- TP -- This qualifier is used for pesticide/Aroclor target analytes when there is a greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a "P".
- U -- Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the reporting limit for that compound. The reporting limit can vary from sample to sample depending on dilution factors or percent moisture adjustments when indicated.

Organic Sample ID Qualifiers

The qualifiers that may be appended to the Lab Sample ID and/or the Client Sample ID for organic analyses are defined below:

- DL -- Diluted reanalysis. Indicates that the results were determined in an analysis of a secondary dilution of a sample or extract. The "DL" suffix may be followed by a digit to indicate multiple dilutions of the sample or extract. The results of more than one diluted reanalyses may be reported.
- MS -- Matrix spike (may be followed by a digit to indicate multiple matrix spikes within a sample set).
- MSD Matrix spike duplicate (may be followed by a digit to indicate multiple matrix spikes within a sample set).
- R -- Reanalysis. The extract was reanalyzed without re-extraction. The "R" is not used if the sample was also re-extracted. May be followed by a digit to indicate multiple reanalyses of the sample at the same dilution.
- RE -- Re-extraction analysis. The sample was re-extracted and reanalyzed. May be followed by a digit to indicate multiple re-extracted analyses of the sample at the same dilution.

ii Rev. 2/28/95

a.

Sample ID Cross-reference Table

QAL, Inc. Lab Sample	ID	Client Sample ID	Collect Date	Sample Matrix	Additional Description	
FS = Field	d Samp	le; RB = Rin	sate Blank	; TB = Trip Blank		
MB444000	FS	ADM	07/25/96	Administration	· · · · · · · · · · · · · · · · · · ·	
MB444001	RB	OLD7174R2	07/23/96	Water	RB-2	
MB444002	FS	OLD717409	07/23/96	Water	MW-9	
MB444003	FS	OLD71749D	07/23/96	Water	MW-9D	
MB444004	FS	OLD717417	07/23/96	Water	MW-17	
MB444005	FŞ	OLD717418	07/23/96	Water	MW-18	
MB444006	FS	OLD717419	07/23/96	Water	MW-19	
MB444007	FS	OLD717420	07/23/96	Water	MW-20	
MB444008	FS	OLD717421	07/23/96	Water	MW-21	
MB444009	FS	OLD717422	07/23/96	Water	MW-22	
MB444010	FS	OLD717423	07/23/96	Water	MW-23	
MB444011	TB	TRIP BLANK	07/23/96	Water	TRIP_BLANK	
MB444012	RB	OLD7174R1	07/22/96	Water	RB-1	
MB444013	FS	OLD717405	07/22/96	Water	MW-5	
MB444014	FS	OLD71745D	07/22/96	Water	MW-5D	
MB444015	FS	OLD717406	07/22/96	Water	MW-6	
MB444016	FS	OLD717407	07/22/96	Water	MW-7	
MB444017	FS	OLD717408	07/22/96	Water	MW-8	
MB444018	FS	OLD717412	07/22/96	Water	MW-12 .	
MB444019	FS	OLD717413	07/22/96	Water	MW-13	
MB444020	FS	OLD717414	07/22/96		MW-14	
MB444021	FS	OLD717415	07/22/96	Water	M₩-15	
MB444022	FS	OLD717416	07/22/96		MW-16	

The above lab sample ID's and cross reference information apply to samples as received by the laboratory. Modifiers to the lab sample ID may be added for internal tracking purposes. Any modified sample ID will be reflected in the appropriate case narrative only.

Sample ID Cross-reference Table

QAL, Inc. Lab Sample	ID	Client Sample ID	Collect Date	Sample Matrix	Additional Description	
FB = Field	d Blan	k; FS = Fiel	d Sample;	TB = Trip Blank		
MB444001	FB	OLD7174R2	07/23/96	Water	RB-2	
MB444002	FŞ	OLD717409	07/23/96	Water	MW-9	
MB444003	FS	OLD717409D	07/23/96	Water	M₩-9D	
MB444004	FS	OLD717417	07/23/96	Water	MW-17	
MB444005	FS	OLD717418	07/23/96	Water	MW-18	
MB444006	FS	OLD717419	07/23/96	Water	MW-19	
MB444007	FS	OLD717420	07/23/96	Water	MW-20	
MB444008	FS	OLD717421	07/23/96	Water	MW-21	
MB444009	FS	OLD717422	07/23/96	Water	MW-22	
MB444010	FS	OLD717423	07/23/96	Water	MW-23	
MB444011	TB	TRIP_BLANK	07/23/96		TRIP_BLANK	
MB444012	FS	OLD7174R1	07/22/96		RB-1	
MB444013	FS	OLD717405	07/22/96	Water	MW-5	
MB444014	F\$	OLD71745D	07/22/96	Water	MW-5D	
MB444015	FS	OLD717406	07/22/96	Water	MW-6	
MB444016	FS	OLD717407	07/22/96	Water	MW-7	
MB444017	FS	OLD717408	07/22/96	Water	MW-8	
MB444018	FS	OLD717412	07/22/96	Water	MW-12	
MB444019	FŞ	OLD717413	07/22/96	Water	MW-13	
MB444020	FS	OLD717414	07/22/96	Water	MW-14	
MB444021	FS	OLD717415	07/22/96	Water	MW-15	
MB444022	FS	OLD717416	07/22/96	Water	MW-16	

The above lab sample ID's and cross reference information apply to samples as received by the laboratory. Modifiers to the lab sample ID may be added for internal tracking purposes. Any modified sample ID will be reflected in the appropriate case narrative only.

GC PURGEABLE HALOCARBONS

CASE NARRATIVE GC PURGEABLE HALOCARBONS

QAL I	Lab Reference No./SDG.: MB444
Proje	ect: ABB UST
I.	RECEIPT
	No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.
II.	HOLDING TIMES
	A. Sample Preparation: All holding times were met.
	B. Sample Analysis: All holding times were met.
ıı.	METHOD
	Preparation: N/A Cleanup: N/A Analysis: EPA 601(MOD)
IV.	PREPARATION
	Sample preparation proceeded normally.
v.	ANALYSIS
	A. Calibration: All acceptance criteria were met.
	B. Blanks: All acceptance criteria were met.
	C. Surrogates: All acceptance criteria were met.
	D. Spikes: All acceptance criteria were met.
	E. Samples: Sample analyses proceeded normally.
agree excep hardo perso	ctify that this data package is in compliance with the terms and conditions and to by the client and QAL, Inc., both technically and for completeness, of for the conditions noted above. Release of the data contained in this copy data package has been authorized by the Laboratory Manager or designated on, as verified by the following signature.
SIGNI	Douglas Burnett Resource Chemist, Organics

CASE NARRATIVE Addendum

Sample Information

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	SAMPLE pH ¹
MB444001	OLD7174R2	WATER	07/23/96	N/A	08/05/96	< 2
MB444002	OLD717409	WATER	07/23/96	N/A	08/05/96	< 2
MB444003	OLD717409D	WATER	07/23/96	N/A	08/05/96	< 2
MB444004	OLD717417	WATER	07/23/96	N/A	08/05/96	< 2
MB444005	OLD717418	WATER	07/23/96	N/A	08/05/96	< 2
MB444006	OLD717419	WATER	07/23/96	N/A	08/05/96	< 2
MB444007	OLD717420	WATER	07/23/96	N/A	08/05/96	< 2
MB444008	OLD717421	WATER	07/23/96	N/A	08/05/96	< 2
MB444009	OLD717422	WATER	07/23/96	N/A	08/05/96	< 2
MB444010	OLD717423	WATER	07/23/96	N/A	08/05/96	< 2
MB444011	TRIP BLANK	WATER	07/23/96	N'/A	08/05/96	< 2
MB444012	OLD7174R1	WATER	07/22/96	N/A	08/05/96	< 2
MB444013	OLD717405	WATER	07/22/96	N/A	08/03/96	< 2
MB444014	OLD71745D	WATER	07/22/96	N/A	08/03/96	< 2
MB444015	OLD717406	WATER	07/22/96	N/A	08/03/96	< 2
MB444016	OLD717407	WATER	07/22/96	N/A	08/03/96	< 2
MB444017	OLD717408	WATER	07/22/96	N/A	08/03/96	< 2
MB444018	OLD717412	WATER	07/22/96	N/A	08/03/96	< 2
MB444019	OLD717413	WATER	07/22/96	N/A	08/03/96	< 2
MB444020	OLD717414	WATER	07/22/96	N/A	08/03/96	< 2
MB444021	OLD717415	WATER	07/22/96	N/A	08/03/96	< 2
MB444022	OLD717416	WATER	07/22/96	N/A	08/02/96	< 2
VWB10802	VWB10802	WATER	N/A	N/A	08/02/96	N/A
VWB10805	VWB10805	WATER	N/A	N/A	08/05/96	N/A

Applies to samples designated for purgeable VOA analysis only.

	ab Sample Number: Site Locator Collect Date:		MB444013 7174 D717405/MW-5 22-JUL-96 QUAL UNITS	DL	OLD717 22-	444015 7174 7406/MW-6 JUL-96 AL UNITS	DL	OLD7	18444015RE 7174 717406RE/MW 22-JUL-96 QUAL UNITS	VALUE	LD7174	44016 174 407/MW-7 JUL-96 _ UNITS	DL	
		VALUE	QUAL UNITS	DE .	VALUE 407	CE ONITS		VALUE	20/12 0/11/0	 				
EDB														
Ethylene dibromide		.02	U ug/l	.02	.02 U	ug/l	.02	-		.0	12 U	ug/l	.02	
EPA 601/602														
Chloromethane			U ug∕l	1	1 U	ug/l	1	•			1 U	ug/l	1	
Bromomethane			U ug/l	1	1 U	ug/l	1				1 U	ug/l	1	
Dichlorodifluorometha	ne		U ug/l	1	1 U	ug/l	1	-	f	1	1 U 1 U	ug/l	1	
Vinyl chloride			U ug/L	1	1 U	ug/l	1	•	ř.	A.	1 U	ug/l ug/l	i	
Chloroethane	**************************************	District Control of the Control of t	U ug/l		1 U	ug/l	1 5	=			5 U	ug/l ug/l	5	
Methylene chloride			U ug/l	5	5 U	ug/l)	•			1 U	ug/l	1	
Trichlorofluoromethan	e		U ug/l		1 U	ug/l	1:00 1:00				1 U	ug/l ug/l	i	
1,1-Dichloroethene			U ug/l		1 U	ug/l	1:::	_			1 0	ug/l	i	
1,1-Dichloroethane			U ug/l	1	1 U 1 U	ug/l	1				i ŭ	ug/l	i	
trans-1,2-Dichloroeth	ene		U ug/l U ug/l		1 0	ug/l ug/l	1	2			1 Ŭ	ug/l	i	
Chloroform				1	1 0	ug/l ug/l	1.00 1.00			-4	ί ΰ	ug/l	i	
1,2-Dichloroethane			U ug/l U ug/l	•	1 0	ug/l	1	_			1 Ū	ug/l	1	
1,1,1-Trichloroethane Carbon tetrachloride			U ug/l	1	1 0	ug/l	i				1 U	ug/l	1	
Bromodichloromethane			U ug/l	1	1 Ŭ	ug/l	i				1 U	ug/l	1	
1,2-Dichloropropane			U ug/l	1	1 บ	ug/l	1				1 U	ug/l	1	
cis-1,3-Dichloroprope	ne		U ug/t	1	1 Ū	ug/l	1	-			1 U	ug/l	1	
Trichloroethene	()-		U ug/l	1	1 U	ug/l	18	-			1 U	ug/l	1	
Dibromochloromethane		1	U ug/l	1	1 ປ	ug/l	1				1 U	ug/l	1	
1.1.2-Trichloroethane		1	U ug/l	1	1 U	ug/l	1	-			1 U	ug/l	1	
trans-1,3-Dichloropro		1	U ug/l	1	1 U	ug/l	1	•			1 U	ug/l	1	
Bromoform			U ug/l	1	1 U	ug/l	1			į	1 U	ug/l	1	
1,1,2,2-Tetrachloroet	hane		U ug/l	1	1 U	ug/l	1	•			1 U	ug/l	1	
Tetrachloroethene			U ug/l	1	1 U	ug/l	188	•			1 U	ug/l		
Chlorobenzene			U ug/l	2	1 U	ug/l	10	•			1 U	ug/l	4	
1,3-Dichlorobenzene			U ug/l	2		ug/l	1	•			1 U 1 U	ug/l ug/l	1	
1,2-Dichlorobenzene			U ug/l	2	1 U	ug/l	100				1 U	ug/l ug/l	1	
1,4-Dichlorobenzene			U ug/l	2	1 U	ug/l	ļ.,				1 0	ug/l	i	
Methyl tert-butyl eth	er		U ug/l	2	1 U	ug/l	1			1	.2	ug/l	i	
Benzene		130		2	1 U 1 U	ug/l	1			•	. 2 1 U	ug/l	i	
Toluene		15	the state of the s	2 2	1 U	ug/l ug/l	1				1 Ŭ	ug/l	i	
Chlorobenzene		79	After the first the control of the c	2	1 0	ug/l	1	_		j.	1 0	ug/l	1	
Ethylbenzene				۲	-	ug/ t	•				_	-3,		
Xylenes (total)		10		. 2	1 U	ug/l	1				1 U	ug/l	1	
o-Xylene m,p-Xylene		38		4	żΰ	ug/l	Ż	-			2 U	ug/l	2	
LEAD Lead		21	ug/l	3	43.4	ug/l	3	+			16	ug/l	3	
PNA COMPDS					_		_#	_			2 11		2	
Naphthalene		19		2	2 U	ug/l	2		U ug/l		2 U	ug/l	2	
2-Methylnaphthalene		6		5	2 U	ug/l	2		U ug/l	2	2 U	ug/l	2	
1-Methylnaphthalene		3		2	2 U	ug/l	2		U ug/l		2 U 2 U	ug/l ug/l	2	
Acenaphthylene			U ug/l	2	2 U	ug/l	2		U ug/l	2 2	2 U	ug/l ug/l	2	
Acenaphthene			U ug/l	2	2 U 2 U	ug/l	2		U ug/l U ug/l	2	2 U	ug/t ug/l	2	
Fluorene		2	U ug/l	2	2 0	ug/l	۷		ug/t	•		ug/ t	_	

				BUILDING ORLANDO FLO			1 5.				
Lab Sample Number: Site Locator Collect Date:	7 OLD717 22-	44013 7174 7405/MW-5 JUL-96 IL UNITS	DL V	71 0LD7174 22-	4015 74 06/MW-6 IUL-96 UNITS	DL VAL	MB4440 717 OLD717406 22-JU UE QUAL	74 SRE/MW-6		MB444016 7174 OLD717407/MW-7 22-JUL-96 QUAL UNITS	DL
Phenanthrene Anthracene Fluoranthene Pyrene Benzo (a) anthracene Chrysene Benzo (b) fluoranthene Benzo (x) fluoranthene Benzo (a) pyrene Indeno (1,2,3-cd) pyrene Dibenzo (a,h) anthracene Benzo (g,h,i) perylene TAL PETROLEUM MYDROCARBON Total petroleum hydrocarbon	2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	222222222222222222222222222222222222222	2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	2 2 2 2 2 2 2 2 2 2 2 2 2	2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	22222	2 U ug/l 3 U ug/l 3 U ug/l 3 U ug/l	2 2 2 2 2 2 2 2 2 2 2 2 2

Lab Sample Num Loc Collect D	Site ator	7 OLD717	44017 174 408/MW-8 JUL-96			71 LD7174 23-J	14002 174 109/MW-9 1UL-96			OLD7174 22-J	74 12/MW-12 UL-96			MB444019 7174 717413/MV 22-JUL-96	5	
	VALU	E QUA	LUNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL UNII	S D	·L
DB Ethylene dibromide		.02 U	ug/l	.02	.0	2 U	ug/l	.02		02 U	ug/l	.02	.02	U ug,	/l	.02
Ethytene arbi oiltae			-3/1		•	-	3. -				-					
PA 601/602						_									, i	1
Chloromethane		1 U	ug/l			1 U	ug/l	1,		1 U	ug/l	1	1			
Bromomethane		1 U	ug/l	1		1 U	ug/l	1		1 U ,	ug/l		1			,
Dichlorodifluoromethane		1 U	ug/l	1		1 U	ug/l	1		1 U	ug/l		1			1
Vinyl chloride		1 0	ug/l	1		1 U	ug/l	1		1 U	ug/l	1	1		7 L	1
Chloroethane		1 U	ug/l			1 U	ug/l	1		1 U	ug/l					Ė
Methylene chloride		. 5 U	ug/l	5		5 U	ug/l	5		5 U	ug/l	5	5 1			1
Trichlorofluoromethane		1 U	ug/l	1		1 U	ug/l	1		1 U	ug/l		•			4
1,1-Dichloroethene		1 บ	ug/l	1		1 U	ug/l	1		1 U	ug/l		1			
1,1-Dichloroethane		1 U	ug/l	1		1 U	ug/l	1		1 U	ug/l	1	1			<u> </u>
trans-1,2-Dichloroethene		1 U	ug/l	1		1 U	ug/l	1		1 U	ug/l		1			4
Chloroform		1 U	ug/l	1		1 U	ug/l	1		1 U	ug/l	1	1			
1,2-Dichloroethane		. 1 U	ug/l	1		1 U	ug/l	1		1 U	ug/l		-			4
1,1,1-Trichloroethane		1 U	ug/l	1		1 U	ug/l	1:		1 U	ug/l	1	1			<u> </u>
Carbon tetrachloride		1 U	ug/l	1		1 U	ug/l	10		1 U	ug/l			U ug, U ug,		i
Bromodichloromethane		1 U	ug/l	1		1 U	ug/l	1		1 U	ug/l			U ug,	/ L	•
1,2-Dichloropropane		1 U	ug/l	1		1 U	ug/l	T _a		1 U	ug/l		-	U ug,		1
cis-1,3-Dichloropropene		1 U	ug/l	1		1 U	ug/l	18		1 U	ug/l	1	-	U ug,		i
Trichloroethene		1 U	ug/l	1		1 U	ug/l	1		1 U	ug/l		•	U ug,		i
Dibromochloromethane		1 U	ug/l	1		1 U	ug/l	10		1 U	ug/l			U ug,		i
1,1,2-Trichloroethane		1 U	ug/l	1		1 U	ug/l	1.		1 U	ug/l	1		U ug,		ì
trans-1,3-Dichloropropene		1 U	ug/l	1		1 U	ug/l	1		1 0	ug/l			U ug,		1
Bromoform		1 U	ug/l			1 U	ug/l	1:		1 U	ug/l			U ug.		i
1,1,2,2-Tetrachloroethane		1 U	ug/l	1		1 U	ug/l	l i		1 U 1 U	ug/l	4		U ug.		i
Tetrachloroethene		1 U	ug/l	1		1 U	ug/l	l:		1 0	ug/l			U ug.		i
Chlorobenzene		1 U	ug/l	1		1 U	ug/l	1.		1 0	ug/l	1		U ug		i
1,3-Dichlorobenzene		1 U	ug/l			1 U	ug/l	1		1 U	ug/l	4	-	U ug,		i
1,2-Dichlorobenzene		1 U	ug/l	1		1 U	ug/l		맛 부린 갤	1 0	ug/l			U ug,		1
1,4-Dichlorobenzene		1 U	ug/l			1 U	ug/l	1		1 0	ug/l	4		U ug		1
Methyl tert-butyl ether		1 U	ug/l	: I		1 U	ug/l	1:		The Property of the Contract o	ug/l		71	ug		1
Benzene		1 U	ug/l	1		1 U	ug/l	1		41 1 U	ug/l ug/l		67	ug.		1
Toluene		1 U	ug/l	1		1 U	ug/l	1		10	ug/l ug/l			U ug		i
Chlorobenzene		1.0	ug/l	1		1 U	ug/l	1		15			12	ug,		1
Ethylbenzene		1 U	ug/l			1 U	ug/t	1		10	ug/l		12.	ug	, `	•
Xylenes (total)						-		1		- 1 U	ug/l	1	39	ug	/1	1
o-Xylene		1 U	ug/l	1		1 U	ug/l			.6		2	100	ug		2
m,p-Xylene		2 U	ug/l	2		2 U	ug/l	2	•	.0	ug/l		100	ug	, .	_

---- BUILDING NUMBER 7174 ----

Lab Sample Number: Site Locator Collect Date:	71 OLD7174 22-j	08/MW-8 UL-96	DL VAI	7 OLD717 23-	44002 174 409/MW-9 JUL-96 L UNITS	DL	OI VALUE	MB444018 7174 D717412/MW-1 22-JUL-96 QUAL UNITS	12 DL	OLD7	18444019 7174 717413/MW-13 22-JUL-96 1UAL UNITS	DL
EAD Lead	12.7	ug/l	3	8.8	ug/l	3	30.9		3	·	ug/l	3
PNA COMPDS Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Behzo (a) anthracene Chrysene Benzo (b) fluoranthene Benzo (b) fluoranthene Benzo (a) pyrene Indeno (1,2,3-cd) pyrene Dibenzo (a,h) anthracene Benzo (g,h,i) perylene TOTAL PETROLEUM HYDROCARBON Total petroleum hydrocarbon	2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	222222222222222222222222222222222222222	2 U U U U U U U U U U U U U U U U U U U	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	.05	2	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	3 3 2 1 2 1 2 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	.05

Lab Sample Number: Site Locator Collect Date:		MB444020 7174 LD717414/MW- 22-JUL-96	14	Ol	MB444021 7174 D717415/MW 22-JUL-96			7 OLD717 22-	44022 174 416/MW-16 JUL-96			23-JUI	4 7/MW-17 L-96	
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNIT	S DL	VALUE	QUA	L UNITS	DL	VALUE	QUAL (JNITS	DL
DB Ethylene dibromide	.0	2U ug/l	.02	.02	!U ug/	t	.02	.02 U	ug/l	.02	.02	? U	ug/l	.02
•		_												
PA 601/602		4 14	4		U ug/		1	1 U	ug/l	4	1	U	ug/l	1
Chloromethane		1 U ug/l					1,000	1 Ŭ	ug/t ug/l	į,		ŭ	ug/l	i
Bromomethane		1 U ug/					43030333333	1 0 '	ug/l			Ü	ug/l	i
Dichlorodifluoromethane		1 U ug/			U ug/		100000000000000000000000000000000000000	1 U				Ü	ug/l	í
Vinyl chloride		1 U ug/			ป ug/		1,000,000	10	ug/l	4	•	Ü	ug/l	i
Chloroethane		1 U ug/			ປ ug/		5		ug/l			Ü	ug/l	Ė
Methylene chloride		5 U ug/			U ug/		2	5 U	ug/l			ט ט	ug/l ug/l	1
Trichlorofluoromethane		1 U ug/			U ug/			1 U	ug/l			Ü	ug/l ug/l	i
1,1-Dichloroethene		1 U ug/			U ug/		1	1 U	ug/l	4		U	ug/l ug/l	4
1,1-Dichloroethane		1 U ug/l			U ug/		L	1 U	ug/l			U		4
trans-1,2-Dichloroethene		1 U ug/l			U ug/		1	1 U	ug/l			U	ug/l ug/l	4
Chloroform		1 U ug/			U ug/		1	1 U	ug/l			U	•	
1,2-Dichloroethane		1 U ug/			U ug/		1	1 U	ug/l	<u>.</u>		U	ug/l	4
1,1,1-Trichloroethane		10 ug/1			U ug/		1	1 U	ug/l			i U	ug/l	
Carbon tetrachloride		1 U ug/			U ug/		1	1 U	ug/l			ט ט	ug/l	4
Bromodichloromethane		1 U ug/			U ug/		1	1.0	ug/l	1		יט ו	ug/l	
1,2-Dichloropropane		1 U ug/			U ug/		1	1 U	ug/l			lu	ug/l	<u> </u>
cis-1,3-Dichloropropene		1 U ug/			U ug/		1	1 U	ug/l			-	ug/l	- 1
Trichloroethene		1 U ug/			U ug/		1	1 U	ug/l			U	ug/l	
Dibromochloromethane		1 U ug/			U ug/		1	1 U	ug/l			U	ug/l	1
1,1,2-Trichloroethane		1 U ug/	1		U ug/		1	1 U	ug/l			i U	ug/l	
trans-1,3-Dichloropropene		1 U ug/			U ug/		1	1 U	ug/l	1		l U	ug/l	<u> </u>
Bromoform		1 U ug/			U ug/		1	1 U	üg/l	1		וט	ug/l	<u> </u>
1,1,2,2-Tetrachloroethane		1 U ug/			IU ug/		1,500,000	1 U	ug/l			l U	ug/l	
Tetrachloroethene		1 U ug/			lU ug/			1 U	ug/l	1		U	ug/l	1
Chlorobenzene		1 U ug/			IU ug/			1 U	ug/l			l U	ug/l	
1,3-Dichlorobenzene	And the second second second	1 U ug/			IU ug/		1	1 U	ug/l	1		l U	ug/l	
1,2-Dichlorobenzene		1 U ug/	1		IU ug/		14000000	1 U	ug/l	1		U	ug/l	1
1,4-Dichlorobenzene		1 U ug/			IU ug/		1	1 U	ug/l			l U	ug/l	1
Methyl tert-butyl ether		1 U ug/			IU ug/		1	1 U	ug/l			l U	ug/l	1
Benzene		1 U ug/	t dieks i		IU ug∕		1	1 U	ug/l			וט	ug/l	1
Toluene		1 U ug/			U ug/		1	1 U	ug/l	1		U	ug/l	1
Chlorobenzene		1 U ug/			lU ug/		1	1 U	ug/l	3 al		l U	ug/l	1
Ethylbenzene		1 U ug/			ili ug/	l	1	1 U	ug/l	1		I U	ug/l	1
Xylenes (total)		-												
o-Xylene		1 U ug/	l d		IU ug/	l	1	1 U	ug/l	. 1		l U	ug/l	1
m,p-Xylene		2 U ug/	. 2		2ປ ug/	l	2	2 U	ug/l	2	7	2 U	ug/l	2

NTC OPLANDO FLORIDA MCCOY Appex

		NTC	ORLANDO FLORIDA McCo		ex					
Lab Sample Number: Site Locato Collect Date:	7174 OLD717414/M	₩-14	MB444021 7174 OLD717415/MW-15 22-JUL-96		7 OLD717	44022 174 416/MW-16 JUL-96		7 OLD 7 17	44004 174 417/MW-17 JUL-96	,
Jorrado Pares	VALUE QUAL UNI		ALUE QUAL UNITS	DL		LUNITS	DL		L UNITS	DL
LEAD Lead	5.5 ug	/L 3	16.2 ug/l		3 21.7	ug/l	3	4.8	ug/l	3
PNA COMPDS Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo (a) anthracene Chrysene Benzo (b) fluoranthene Benzo (a) pyrene Indeno (1,2,3-cd) pyrene Dibenzo (a,b) anthracene Benzo (g,h,i) perylene TOTAL PETROLEUM HYDROCARBON Total petroleum hydrocarbon	2 U ug 3 U ug 3 U ug 4 U ug 4 U ug 5 U ug 6 U ug 7 U ug	/ L 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 U ug/l		2 2 U 2 U	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	.06	2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	222222222222222222222222222222222222222

	Lab Sample Number: Site Locator Collect Date:		MB444005 7174 0717418/MW- 23-JUL-96 QUAL UNITS		OL: VALUE	MB444006 7174 D717419/MW 23-JUL-96 QUAL UNIT		VALUE	71 OLD7174 23-	4007 74 20/MW-20 UL-96 UNITS	DL	OLD71 23	444008 7174 7421/mw-2° -JUL-96 AL UNITS	I DL
		VALUE	QUAL UNITS	DL.	VALUE	WOAL ORT		- VNC0-						
В											.02	.02 U	ug/l	.02
Ethylene dibromide		.02	U ug/l	.02	.02	U ug/	ι.	02	.02 U	ug/l	.02	.02 0	ug/ t	.02
A 601/602														•
Chloromethane		1	U ug/l	1		U ug/		1	1 U	ug/l	1	1 U	ug/l	
Bromomethane		1	U ug/l	1	1	U ug/		1	1 U ,	ug/l	1	1 U	ug/l	
Dichlorodifluorometh	nane	1	U ug/l	1		U ug/	ι	1	1 U	ug/l	1	1 U	ug/l	1
Vinyl chloride		1	U ug/l	- 1	•	U ug/	ι	1	1 U	ug/l	1	1 U	ug/l	1
Chloroethane		1	U ug/l	1	1	U ug/	į	1	1 U	ug/l	1	1 U	ug/l	1
Methylene chloride		5	U ug/l	5	5	U ug/		5	5 U	ug/l	. 5	5 U	ug/l	5
Trichlorofluorometh	ane	1	U ug/l	1	1	U ug/	l	1	1 U	ug/l	1	1 U	ug/l	1
1.1-Dichloroethene		1	U ug/l	1	1	U ug/	l	1	1 U	ug/l	1	1 U	ug/l	1
1,1-Dichloroethane		1	U ug/l		1	U ug/	ι	1	1 U	ug/l	1	1 U	ug/l	1
trans-1,2-Dichloroe	thene	1	U ug/l	1	1	U ug/	l	1	1 U	ug/l	1	1 0	ug/l	1
hloroform		1	U ug/i		1	U ug/	ι	1	1.0	ug/l	1	1 U	ug/l	1
1.2-Dichloroethane		1	U ug/l		1	U ug/	ι	1	1 U	ug/l	1	1 0	ug/l	1
,1,1-Trichloroetha	ne	1	U ug/1		1	U ug/	l	1	1 U	ug/l	1.	1 U	ug/l]
Carbon tetrachlorid		1	U ug/	1	1	U ug/	l	1	1 U	ug/l	1	1 U	ug/l	1
romodichloromethan			U ug/	1	1	ປ ug/	t	1	1 U	ug/l	1	1 ນ	ug/l	1
1,2-Dichloropropane		1	U ug/		1	U ug/	l	1	1 U	ug/l	1	1 U	ug/l	1
is-1,3-Dichloropro		1	U ug/		1	U ug/	l	1	1 U	ug/l	1.	1 U	ug/l	1
Trichloroethene		1	U ug/	1	1	U ug/	l	1	1 U	ug/l	1	1 U	ug/l]
Dibromochloromethan	e	1	U ug/		1	U ug/	l	1	1 U	ug/l	1	1 U	ug/l	1
1.1.2-Trichloroetha		1	U ug/		1	U ug/	l	1	1 U	ug/l	1	1 U	ug/l	1
trans-1,3-Dichlorop		. 1	U ug/		: 1	U ug/	l	1	1 U	ug/l	1	1 0	ug/l]
Bromoform		1	U ug/		1	U ug/	l	1	1 U	ug/l	1	1 U	ug/l	3
1,1,2,2-Tetrachloro	ethane	1	U ug/		1	U ug/	l	1	1 U	ug/l	1	1 ປ	ug/l	1
Tetrachloroethene		1	U ug/		1	U ug/	l	1	1 U	ug/l	1	1 บ	ug/l	1
Chlorobenzene		1	U ug/		1	U ug/	l	1	1 U	ug/l	1	1 ບ	ug/l	1
1.3-Dichlorobenzene		1	U ug/		1	U ug/	l	1	1 U	ug/l	1	1 U	ug/l	1
1.2-Dichlorobenzene		1	U ug/		1	U ug/	l	1	1 U	ug/l	1	1 ປ	ug/l	1
1,4-Dichlorobenzene			U ug/		1	U ug/		1	1 U	ug/l	1	1 U	ug/l	1
Methyl tert-butyl e			U ug/		1	U ug/		1	1 U	ug/l	1	1 U	ug/l	1
Benzene			U ug/		1	U ug/	l	1	1 U	ug/l	1	1 ປ	ug/l	1
Toluene			U ug/		1	U ug,		1	1 U	ug/l	1	1 ປ	ug/l	1
Chlorobenzene			U ug/		1	U ug,		1	1 U	ug/l	1	1 ປ	ug/l	1
Ethylbenzene			U ug/			U ug,		1	1 U	ug/l	1.1.1	1 U	ug/l	1
Xylenes (total)			o ag,		_	•						-		
o-Xylene		1	U ug/	1	1	U ug,	'i	1	1 U	ug/l	1	1 U	ug/l	1
m,p-Xylene	지 않시.		U ug/			່ປ ug,		2	2 U	ug/l	2	2 U	ug/l	2
TO THE STATE OF TH			- ug/		٠	49/	-						-	

---- BUILDING NUMBER 7174 ----

	ple Number: Site Locator Ollect Date:	71 OLD7174 23-J	4005 74 18/MW-18 UL-96 UNITS	DL	OLD71 23	444006 7174 7419/MW-19 -JUL-96 AL UNITS) DL	O VALUE	71 LD7174 23-J	4007 74 20/mw-20 UL-96 UNITS	DL	O VALUE	71 LD7174 23-J	4008 74 21/MW-21 UL-96 UNITS	DL
EAD Lead		29.3	ug/l	3	9.8	ug/l	3	11.	1	ug/l	3	30.		ug/l	3
NA COMPDS Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene Acenaphthylene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo (a) anthracene Chrysene Benzo (b) fluoranthene Benzo (b) fluoranthene Benzo (a) pyrene Indeno (1,2,3-cd) pyrene Dibenzo (a,h) anthracene Benzo (g,h,i) perylene TOTAL PETROLEUM HYDROCARBON Total petroleum hydrocarbon		2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	222222222222222222222222222222222222222	2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U 2 U	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	.05		2 U U U U U U U U U U U U U U U U U U U	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	200000000000000000000000000000000000000		222222222222222222222222222222222222222	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	.05

NTC ORLANDO FLORIDA McCoy Annex

L	ab Sample Number: Site Locator Collect Date:	OLD717 23	444009 7174 7422/MW-22 -JUL-96 AL UNITS	DL	7 OLD717 23-	44010 174 423/MW-23 JUL-96 L UNITS	DL	VAI	7' OLD7174 22-	44014 174 45D/MW-5D JUL-96 L UNITS	DL	7 OLD717 23-	44003 7174 749D/MW-9D JUL-96 IL UNITS	DL
AD Lead		84.9	ug/l	3	88.8	ug/l		3	17.9	ug/l	3	5.4	ug/l	3
IA COMPDS		2 U		9	2 U	ug/l		2	21	ug/l	7	2 U	ug/l	2
Naphthalene		2 U	ug/l ug/l	5	2 U	ug/l		2	7	ug/l	2	2 Ū	ug/l	2
2-Methylnaphthalene		2 U		5	2 U	ug/l		5	5	ug/l	5	ŽŪ	ug/l	2
1-Methylnaphthalene		2 U	ug/t	5	2 U	ug/l ug/l		5	Ź U	ug/l	5	ŽŪ	ug/l	2
Acenaphthylene		2 U	ug/l	Ş	2 U	ug/l		2	2 0	ug/l	- 5	ŽŪ	ug/l	Ž
Acenaphthene			ug/l		2 U	ug/l		2	2 0	ug/l		2 Ū	ug/l	2
Fluorene		2 U	ug/l	- 6	2 U	ug/l ug/l		2	2 0	ug/l	5	2 Ü	ug/l	ž
Phenanthrene		2 U	ug/l	- 5	2 U	ug/l ug/l		2	ŽÜ	ug/l	5	ŽŪ	ug/l	Ž
Anthracene		2 U	ug/l	ξ.	2 U			2	2 Ü	ug/l	5	2 U	ug/l	2
Fluoranthene		2 U	ug/l		2 U	ug/l		2	2 0	ug/l	5	2 0	ug/l	2
Pyrene		2 0	ug/l	5	2 U	ug/l		5	2 0	ug/l	5	2 0	ug/l	2
Benzo (a) anthracene		2 U	ug/l			ug/l		2	2 U	ug/l	5	2 U	ug/l	2
Chrysene		2 U	ug/l	ζ,	2 U	ug/l		2	2 U	ug/l	5	2 Ü	ug/l	2
Benzo (b) fluoranther	ie	2 U	ug/l	ξ.	2 U	ug/l		2	2 U	ug/l	5	2 U	ug/l	2
Benzo (k) fluoranther)e	2 U	ug/l	ξ.	2 U	ug/l		2	2 U	ug/l ug/l	5	2 U	ug/l	2
Benzo (a) pyrene		2 U	ug/l	ξ.	2 U	ug/l		2	2 U	ug/t ug/t	2	2 U	ug/l	2
Indeno (1,2,3-cd) pyr		2 υ	ug/l		2 U	ug/l		2	2 U	ug/t ug/l	5	2 U	ug/l	2
Dibenzo (a,h) anthrac		2 0	ug/l	ζ.	2 U	ug/l		2	2 U	ug/l ug/l	2	2 U	ug/l	2
Benzo (g,h,i) peryler	1 ë	2 U	ug/l	2	2 U	ug/l		۷	2 U	ug/ t	٠	2 0	ug/ t	-
TAL PETROLEUM HYDROCA	ARBON											4.5		05
Total petroleum hydro					.05 <	mg/l	•	05	.34	mg/l	.06	.12	mg/l	.05

	Lab Sample Number: Site Locator	OLD	18444009 7174 717422/MW-22	!	OLD71	444010 7174 7423/MW-23	5	OLI	MB444014 7174 71745D/MW		0	71 LD717	44003 174 49D/MW-9D	
	Collect Date:		23-JUL-96 NUAL UNITS	DL		-JUL-96 AL UNITS	DL	VALUE	22-JUL-96 QUAL UNIT		VALUE		JUL-96 L UNITS	DL
B Ethylene dibromide		.02 (J ug/L	.02	.02 U	ug/l	.02	.02	U ug/	i .02	.0	2 U	ug/l	.02
A 601/602														
Chloromethane		11		1	1 U	ug/l	1		U ug/		1	1 U	ug/l	1
Bromomethane		1 (i ug/l		1 U	ug/l	1		U ug/			1 U	ug/l	1
Dichlorodifluorometh	nane	11	J ug/l	1	1 บ	ug/l	1		U ug/			1 U	ug/l]
Vinyl chloride		1 (J ug/l	1	1 U	ug/l	1		U ug/			1 U	ug/l	1
Chloroethane		1 (J ug/l	1	1 U	ug/l	1		U ug/			1 U	ug/l	1
Methylene chloride		5 l	J ug/l	5	5 U	ug/l	5	5	U ug/	l 5	`.	5 u	ug/l	5
Trichlorofluorometha	ane	1 (1	1 U	ug/l	1	- 1	U ug/	1		1 U	ug/l	1
1.1-Dichloroethene		1 1		1	1 U	ug/l	1	1	U ug/	L 1		1 U	ug/l	1
1.1-Dichloroethane		1 (1	1 U	ug/l	1	- 1	U ug/	L 1		1 U	ug/l	1
trans-1,2-Dichloroet	thene	i i		Í.	1 Ū	ug/l	1	1	U ug/	l 1		1 U	ug/l	1
Chloroform	Circiic	i i		1	i ŭ	ug/l	1	1	U ug/			1 U	ug/l	1
1,2-Dichloroethane				4	1 0	ug/l	1	1	U ug/			1 U	ug/l	1
1,1,1-Trichloroethar	34	1 (1	ίŭ	ug/l	i		U ug/			1 U	ug/l	1
Carbon tetrachloride		1		4	1 Ŭ	ug/l	í		U ug/		Š	1 U	ug/l	1
Bromodichloromethane		11			ίŬ	ug/l	1	 Company of the company /li>	U ug/			1 U	ug/l	1
				4	1 0	ug/l	1		U ug/			1 0	ug/l	1
I,2-Dichloropropane :is-1,3-Dichloroprop		1 1			1 0	ug/l	1	A STATE OF THE STA	U ug/		0.	1 Ü	ug/l	1
	pene				1 U	ug/l	4		U ug/			1 0	ug/l	1
Trichloroethene		1			1 0	ug/l	i		U ug/			1 0	ug/l	1
oibromochloromethane		11		4	1 0		4		U ug/			1 U	ug/l	i
1,1,2-Trichloroethar		and the feet of the second second			1 U	ug/l	1		U ug/			1 U	ug/l	i
trans-1,3-Dichlorop	ropene	1 (1		ug/l	1		U ug/			1 0	ug/l	i
Bromoform		1 !		1001, 4400, 4400, 400, 400, 400, 400, 40	1 U	ug/l		· · · · · · · · · · · · · · · · · · ·		and the second of the second o		1 0	ug/l	ì
1,1,2,2-Tetrachloro	etnane	1 !			1 U	ug/l	1		10000		15	1 U	ug/l	,
Tetrachloroethene		1 !		1	1 U	ug/l	1		U ug/			1 0	ug/l	i i
Chlorobenzene		1 !		1	1 U	ug/l	! 4		U ug/	************************************		1 U		;
1,3-Dichlorobenzene	the second of th	1 (1	1 U	ug/l	1		U ug/		į.	1 U	ug/l	1
1,2-Dichlorobenzene		1 (1	1 U	ug/l	1		U ug/	1 3			ug/l	,
1,4-Dichlorobenzene		1 (1	1 0	ug/l	1		U ug/	1 2	•	1 U	ug/l	
Methyl tert-butyl ei	ther			1	1 ປ	ug/l	1		U ug/	į ž		1 U	ug/l	1
Benzene		1 1		1	1 U	ug/l	1	120		l 2		1 U	ug/l	1
Toluene		1 1		1	1 U	ug/l	1:	13		t Z		1 U	ug/l	1
Chlorobenzene		1 (1	1 U	ug/l	1		U ug/			1 U	ug/l	1
Ethylbenzene		1 1	J ug/l	1	1 U	ug/l	1	68	ug/	l 2	2	1 U	ug/l	1
Xylenes (total)		•			•							-		
o-Xylene		1 (J ug/l	1	1 U	ug/l	1					1 U	ug/l	1
m,p-Xylene		2 ו		2	2 U	ug/l	2	34	ug/	l		2 U	ug/l	2

	ole Number: Site Locator lect Date:	VALUE	OLD71 22	444012 7174 74R1/RB-1 -JUL-96 AL UNITS	DL	OLD71 23	444001 7174 74R2/RB-2 -JUL-96 AL UNITS	DL	TRIP_ VALUE	7 BLAN_ 23-	44011 174 K/TRIP_BL JUL-96 L UNITS	.AN DL	
EDB													
Ethylene dibromide		•	02 U	ug/l	.02	.02 U	ug/l	.02	,				
EPA 601/602													
Chloromethane			1 U	ug/l	1	1 U	ug/l	1		1 U	ug/l	1	
Bromomethane			1 U	ug/l	1	1 U	ug/l	1		1 U	ug/l	1	
Dichlorodifluoromethane			1 U	ug/l	1	1 U	ug/l	1		1 U	ug/l	1	
Vinyl chloride			1 U	ug/l	1	1 U	ug/l	1		l U	ug/l		
Chloroethane			1 U	ug/l	1	1 U	ug/l	1		1 U	ug/l	1	
Methylene chloride			5 U	ug/l	5	5 U	ug/l	5		5 U	ug/l	- 5	
Trichlorofluoromethane			1 U	ug/l	1	1 U	ug/l	1	·	1 U	ug/l	1	
1.1-Dichloroethene			1 U	ug/l	1	1 U	ug/l	1		1 U	ug/l	1	
1.1-Dichloroethane			1 Ŭ	ug/l	1	1 U	ug/l	1		1 U	ug/l	1	
trans-1,2-Dichloroethene			1 U	ug/l	1	1 0	ug/l	1		1 U	ug/l	1	
Chloroform			1 บ	ug/l	1	1 U	ug/l	1		1 U	ug/l	1	
1,2-Dichloroethane			1 U	ug/l	1	1 Ū	ug/l	1		1 U	ug/l	1	
1,1,1-Trichloroethane			่า บ	ug/l	1	1 Ū	ug/l	1		1 U	ug/l	1	
Carbon tetrachloride			1 0	ug/l	1	1 Ū	ug/l	18		1 U	ug/l	1	
Bromodichloromethane			1 U	ug/l	1	1 Ū	ug/l	1		1 U	ug/l	1	
1,2-Dichloropropane			1 Ŭ	ug/l	1	1 Ū	ug/l	1		1 U	ug/l	1	
cis-1,3-Dichloropropene			1 Ŭ	ug/l	Î	1 Ū	ug/l	1		1 U	ug/l	1	
Trichloroethene			1 Ŭ	ug/l	1	1 บั	ug/l	1		1 U	ug/l	1	
Dibromochloromethane			ี 1 บั	ug/l		1 0	ug/l	1		1 U	ug/l	1	
1,1,2-Trichloroethane			1 Ū	ug/l	1	1 Ū	ug/l	1		1 U	ug/l	1	
trans-1,3-Dichloropropene			1 0	ug/l	1	1 U	ug/l	1		1 U	ug/l	1	
Bromoform			1 บั	ug/l	1	1 Ŭ	ug/l	1		1 U	ug/t	1	
1,1,2,2-Tetrachloroethane			1 0	ug/l	1	i Ū	ug/l	1		1 U	ug/l	1	
Tetrachloroethene			1 บ	ug/l		1 Ū	ug/l	1		1 U	ug/l	1	
Chlorobenzene			1 บ	ug/l	1	1 Ŭ	ug/l	1		1 Ū	ug/l	1	
1,3-Dichlorobenzene			ำ บั	ug/l	4	1 Ŭ	ug/l	1		1 U	ug/l	1	
1,2-Dichlorobenzene			1 0	ug/l	1	1 U	ug/l	1		1 U	ug/l	1	
1,4-Dichlorobenzene			1 Ŭ	ug/l	4	1 Ŭ	ug/l	i		1 Ū	ug/l	1	
Methyl tert-butyl ether			1 บั	ug/l		ίŭ	ug/l	i	Access to the control of the control	1 Ü	ug/l		
Benzene			1 0	ug/l ug/l	1	1 0	ug/l	ាំ		1 Ü	ug/l	1	
Toluene			1 0	ug/l		1 0	ug/l	i		1 Ŭ	ug/l	1	
Chlorobenzene			1 U	ug/l ug/l	1	1 0	ug/l	i		ĺŬ	ug/l	i	
Ethylbenzene		라. #	1 0	ug/l ug/l	1	1 0	ug/l	1		, Ŭ	ug/l	i	
Xylenes (total)				49 <i>7</i> (- 10	ug/ t	•			-3/1		
o-Xylene (totat)			1 U	ug/l	1	1 U	ug/l	1		1 U	ug/l	1	
			2 U	ug/l	2	2 U	ug/l	2		2 Ŭ	ug/l	2	
m,p-Xylene			د ت	ug/ t		2 0	ug/ t	۲			~9/ \		
		Mu W											
	ja i												
								- 1					

Lab Sample Number: Site Locator Collect Date:	OLD	18444012 7174 7174R1/RB-1 22-JUL-96 QUAL UNITS	DL	OLD	MB444001 7174 7174R2/R 23-JUL-9 QUAL UNI	в-2 6		MB444011 7174 RIP_BLANK/TRIP_ 23-JUL-96 E QUAL UNITS	
LEAD Lead	3 •	c ug/l	3	3	< ug	/l	3.	-	_
PNA COMPDS						,,	•		
Naph that ene	2 l 2 l		5	2	U ug U ug	/l	2 2		
2-Methylnaphthalene 1-Methylnaphthalene	2 l		2	2			2	_	
Acenaphthylene	້ ຂໍເ	J ug/l	22222222	2			2	-	
Acenaph thene	2 (Ž	2			2	•	
Fluorene	2 (2	2	U ug	/l	2	- 1	
Phenanthrene	2 l) ug/l	2	2	U ug	/l	2	-	
Anthracene	2 l		2	2			2	-	
Fluoranthene	2 L		5	2		/L	2	-	
Pyrene	2 L		2	2			2 2		
Benzo (a) anthracene	2 l 2 l			2 2			2	_	
Chrysene Benzo (b) fluoranthene	2 i		5	2			2	_	
Benzo (k) fluoranthene	ຂັ ເ	J ug/l	5	2		γì	2	_	
Benzo (a) pyrene	2 i		2 2 2 2 2 2 2 2	2		/l	2	-	
Indeno (1,2,3-cd) pyrene	2 (2	U ug	/l	2	•	
Dibenzo (a,h) anthracene	2 (2	2		/L	2	-	
Benzo (g,h,i) perylene	2 (J ug/l	2	2	U ug	/l	2	•	

----- BUILDING NUMBER 7174 ---- HITS TABLE ------NTC ORLANDO FLORIDA McCoy Annex

Lab Sample Number: Site Locator Collect Date:	OLD7'	8444013 7174 17405/MW-5 2-JUL-96 JAL UNITS	DL	OLD7 2	8444015 7174 17406/MW-6 2-JUL-96 UAL UNITS	DL VAL	OLD7174 22	44015RE 7174 406RE/MW-6 -JUL-96 AL UNITS	S DL	OLD7 2	B444016 7174 17407/MW-7 2-Jul-96 UAL UNITS	DL
EPA 601/602 Benzene Toluene Ethylbenzene o-Xylene m,p-Xylene	130 15 79 10 38	ug/l ug/l ug/l ug/l ug/l	2 2 2 2 2 4	- U - U - U - U	ug/l ug/l ug/l	1 1 1 1 2	: : :			1.2 - u - u - u - u	ug/l ug/l	1 1 1 1 2
EAD Lead	21	ug/l	3	43.4	ug/l	3	-	1		16	ug/l	3
PNA COMPDS Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene	19 6 3	ug/l ug/l ug/l	2 2 2 2	- u - u - u	ug/l	2 2 2 2	- U - U - U	ug/l ug/l ug/l	2 2 2	- ն - ն - ն	ug/l	2 2 2
TOTAL PETROLEUM HYDROCARBON Total petroleum hydrocarbon	.14	mg/l	.06	.25	mg/l	. 05	-			.32	mg/l	.06

Lab Sample Number: Site Locator Collect Date:	7 0LD717 22-	44017 174 408/MW-8 JUL-96 L UNITS	DL	OLD71 23	444002 7174 7409/mw-9 -Jul-96 al units	DL	OLD	MB444018 7174 717412/MW-12 22-JUL-96 QUAL UNITS	2 DL	OL: VALUE	MB444019 7174 D717413/MW-13 22-JUL-96 QUAL UNITS	DL
EPA 601/602 Benzene Toluene Ethylbenzene o-Xylene m,p-Xylene	- U - U - U	ug/t ug/t ug/t ug/t ug/t	1 1 1 1 2	- U - U - U - U	ug/l ug/l ug/l ug/l ug/l	1 1 1 1 2	41 15 - 3.6	U ug/l ug/l U ug/l ug/l	1 1 1 1 2	12 39 100	ug/l ug/l ug/l ug/l	1 1 1 1 2
Lead PNA COMPDS Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene	12.7 - U - U - U	ug/l ug/l ug/l ug/l	3 2 2 2 2	8.8 - U - U - U	ug/l ug/l ug/l ug/l	3 2 2 2	30.9 21 8 3	ug/l ug/l ug/l ug/l	3 2 2 2	3	ug/l	3 2 2 2
Total petroleum hydrocarbon	.28	mg/l	.05	.16	mg/l	.05	.3	mg/l	.05	.44	mg/l	.05

Lab Sample Number Sit Locato Collect Date	e r OLD	18444020 7174 717414/MW-14 22-JUL-96		TC ORLAND	MB444021 7174 D717415/MW 22-JUL-96	- 15		OLE	22-JUI	4 6/MW-16 L-96			MB44400 7174 717417/ 23-JUL-	MW-17 96	
ootteet bate	VALUE	NUAL UNITS	DL	VALUE	QUAL UNIT	S DL	٧	ALUE	QUAL (UNITS	DL	VALUE	QUAL UN	ITS	DL
PA 601/602	-1	j ug/l	4		· U ug/	ı	1		U	ug/l	1	-	Ui	ıg/l	1
Benzene Toluene	- 1		1	-	· U ug/	Ł	1	_	U	ug/l	1		UL	ıg/l	1
Ethylbenzene		j ug/l	1		· U ug/	i	1		U	ug/l	1		U L	ig/l ig/l	1 1
o-Xylene			1 2		U ug/	l I	1 2		U	ug/l ug/l	1 2		U	ıg/l ıg/l	2
m,p-Xylene	•	j ug/l	۷	•	ug/	•	_		~ 1	-a, `	•		-	J	_
EAD .	e e		3	16.2) ,,,,,	ı	3	21.7	2	ug/l	3	4.8	ı	ıg/l	3
Lead	5.5	ug/l	3	10.4	g ug/	·	٠	£1.1		48/ r	7	7.0	•	·a/ •	•
NA COMPDS										/1	2	_	U	ıg/l	2
Naphthalene		J ug/l	2		·U ug/ ·U ug/		2 2		U U	ug/l ug/l	2		U	19/t 19/t	2
2-Methylnaphthalene 1-Methylnaphthalene	•		2 2		· U ug/		2		Ü	ug/l				ıg/l	2
OTAL PETROLEUM HYDROCARBON												05		41	O.E.
Total petroleum hydrocarbon	.3	mg/l	.05	•	•			.32		mg/l	.06	.05	< п	ng/l	.05
							-101								
							1.198 1881								

Lab Sample Number Site Locato Collect Date	• • Ol	MB444005 7174 D717418/N 23-JUL-9 QUAL UNI	1W-18 26	L	OLD	MB444006 7174 717419/MW-19 23-JUL-96 QUAL UNITS) DL	VALUE	71 OLD7174 23-J	4007 74 20/MW-20 UL-96 UNITS	DL	OLD71 23	444008 7174 7421/MW-21 -JUL-96 IAL UNITS	DL
A 601/602 Benzene Toluene Ethylbenzene o-Xylene m,p-Xylene		U ug U ug U ug	9/l 9/l 9/l 9/l 9/l	1 1 1 1 2	- - - -	U ug/l U ug/l U ug/l	1 1 1 1 1 2		- U - U - U - U	ug/l ug/l ug/l ug/l ug/l	1 1 1 1 2	- U - U - U - U	ug/l ug/l ug/l ug/l ug/l	1 1 1 1 2
AD Lead	29.3	uç	g/l	3	9.8	ug/l	3	1	1.1	ug/l	3	30.3	ug/l	3
A COMPDS Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene		U uç	g/l g/l g/l	2 2 2 2	- (- (∪ ug/l	2 2 2 2		- U - U - U	ug/l ug/l ug/l	2 2 2 2	- U - U - U	ug/l ug/l ug/l	2 2 2
TAL PETROLEUM HYDROCARBON Total petroleum hydrocarbon	.05	o e mę	g/l	.05	.08	mg/l	. 05		.05 <	mg/l	.05	.05 <	mg/l	.05

---- BUILDING NUMBER 7174 ---- HITS TABLE -----

Lat	Sample Number: Site Locator Collect Date:	MB444009 7174 OLD717422/MW-22 23-JUL-96 VALUE QUAL UNITS I		DL	OI VALUE	MB444010 7174 OLD717423/MW-23 23-JUL-96 VALUE QUAL UNITS		MB444014 7174 OLD71745D/MW-5D 22-JUL-96 DL VALUE QUAL UNITS			MB444003 7174 OLD71749D/MW-9D 23-JUL-96 DL VALUE QUAL UNITS D			DL			
						<u> </u>											*
EPA 601/602																	1
Benzene			- U	ug/l	1		- U - U	ug/l ug/l		1	120 13	ug/l ug/l	2 2		- บ - บ	ug/l ug/l	1
Toluene Ethylbenzene			- บ - บ	ug/l ug/l	•		- U	ug/l		1	68	ug/l	2		- Ū	ug/l	1
o-Xylene			- U	ug/l	i		- U	ug/l		1	9.7	ug/l	2		- U	ug/l	1
m,p-Xylene			+ U	ug/l	2	•	- U	ug/l		2	34	ug/l	4		- U	ug/l	2
.EAD					<u>.</u>		_			-	47.6		3	5.4	ı.	ug/l	3
Lead		84.	9	ug/l	3	88.	8	ug/l		3	17.9	ug/l	,	٠.٠	•	ug/ t	•
NA COMPDS													_				,
Naphthalene			- U	ug/l	2		- U	ug/l		2	21 7	ug/l ug/l	2 2		- U - U	ug/l ug/l	2
2-Methylnaphthalene			- U - U	ug/l ug/l	2 2		- U - U	ug/l ug/l		2	5	ug/l	2		- บั	ug/l	2
1-Methylnaphthalene			7 U	ug/ t	5		Ü	ug/ t								•	
TOTAL PETROLEUM HYDROCARI	BON					0	F .	(1	.0	c	.34	mg/l	.06	.1	,	mg/l	.05
Total petroleum hydroca	arbon		•			.0	5 <	mg/l		כו	.34	mg/ t	.00	• '	_	mg/ t	.03

----- BUILDING NUMBER 7174 ---- HITS TABLE ------

			ı	NTC ORLANDO F	LORIDA McC	oy Annex		,			
Lab Sample Number: Site Locator Collect Date:	OLD717 22-	44012 7174 74R1/RB-1 JUL-96 NL UNITS	DL	OLD71 23	444001 7174 74R2/RB-2 -JUL-96 AL UNITS	DL	TRIP VALUE	_BLANK 23-J	4011 74 /TRIP_BI UL-96 UNITS	L an Dl	
EPA 601/602 Benzene Toluene Ethylbenzene o-Xylene m,p-Xylene	- U - U - U - U - U	ug/l ug/l ug/l ug/l ug/l	1 1 1 1 2	- U - U - U - U	ug/l ug/l ug/l ug/l ug/l	1 1 1 1 2		- U - U - U - U	ug/l ug/l ug/l ug/l ug/l	:	
LEAD Lead	3 <	ug/l	3	3 <	ug/l	3		- 1 -			
PNA COMPDS Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene	- U - U - U	ug/l ug/l ug/l	2 2 2 2		ug/l ug/l ug/l	2 2 2 2		• •			
TOTAL PETROLEUM HYDROCARBON Total petroleum hydrocarbon	.05 <	mg/l	.05	.05 <	mg/l	.05		-			
	The first section of the egyptical section of							HEE			

---- BUILDING NUMBER 7174 ---- HITS TABLE -----NTC ORLANDO FLORIDA McCoy Annex

Lab Sample Number: Site Locator Collect Date:

Lead Resampling and Analysis Results

MB708001 7174 7174MW13/7174 MW-13 03-SEP-96 MB708002 7174 7174MW22/7174 MW-22 03-SEP-96 MB708003 7174 7174mw23/7174 MW-23 03-SEP-96 LUE QUAL UNITS D

QUAL UNITS DL VALUE DL VALUE VALUE QUAL UNITS LEAD ug/l ug/l ug/l Lead

Lab Sample Number: Site Locator Collect Date: MB708001 7174 7174MW13/7174 MW-13 03-SEP-96 VALUE QUAL UNITS DL MB708002 7174 7174MW22/7174 MW-22 03-SEP-96 VALUE QUAL UNITS D MB708003 7174 7174MW23/7174 MW-23 03-SEP-96 VALUE QUAL UNITS D

LEAD 3 U 3 U ug/l 3 ug/l ug/l Lead Lead Resampling and Analysis

GC EXTRACTABLE VOLATILE ORGANICS (EDB)

CASE NARRATIVE GC EXTRACTABLE VOLATILE ORGANICS (EDB)

QAL Lab	Reference No./SDG.	MB444
Project	: ABB UST 527	

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

HOLDING TIMES II.

- Α. Sample Preparation: All holding times were met.
- В. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A Cleanup: N/A

Analysis: EPA 504.1

IV. PREPARATION

Sample preparation proceeded normally.

v. ANALYSIS

- A. Calibration: All acceptance criteria were met.
- В. Blanks: All acceptance criteria were met.
- C. Surrogates: All acceptance criteria were met.
- D. Spikes: Spikes were performed at the method specified frequency. Results are not included in this reporting level.
- Ε. Samples: Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Jammy Cacen	DATE: 8/16/96
Tammy Carey / Chemist	

GC EXTRACTABLE VOLATILE ORGANICS (EDB)
Lab Reference No./SDG: MB444
Page 2

CASE NARRATIVE Addendum

Sample Information

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	SAMPLE DH ¹
MB444001	OLD7174R2	WATER	07/23/96	08/15/96	08/15/96	N/A
MB444002	OLD717409	WATER	07/23/96	08/15/96	08/15/96	N/A
MB444003	OLD71749D	WATER	07/23/96	08/15/96	08/15/96	N/A
MB444004	OLD717417	WATER	07/23/96	08/15/96	08/15/96	N/A
MB444005	OLD717418	WATER	07/23/96	08/15/96	08/15/96	N/A
MB444006	OLD717419	WATER	07/23/96	08/15/96	08/15/96	N/A
MB444007	OLD717420	WATER	07/23/96	08/15/96	08/15/96	N/A
MB444008	OLD717421	WATER	07/23/96	08/15/96	08/15/96	n/A
MB444009	OLD717422	WATER	07/23/96	08/15/96	08/16/96	N/A
MB444010	OLD717423	WATER	07/23/96	08/15/96	08/15/96	N/A
MB444012	OLD7174R1	WATER	07/22/96	08/15/96	08/15/96	N/A
MB444013	OLD717405	WATER	07/22/96	08/15/96	08/15/96	n/A
MB444014	OLD71745D	WATER	07/22/96	08/15/96	08/15/96	N/A
MB444015	OLD717406	WATER	07/22/96	08/15/96	08/15/96	N/A
MB444016	OLD717407	WATER	07/22/96	08/15/96	08/15/96	N/A
MB444017	OLD717408	WATER	07/22/96	08/15/96	08/15/96	N/A
MB444018	OLD717412	WATER	07/22/96	08/15/96	08/15/96	N/A
MB444019	OLD717413	WATER	07/22/96	08/15/96	08/15/96	N/A
MB444020	OLD717414	WATER	07/22/96	08/15/96	08/15/96	N/A
MB444021	OLD717415	WATER	07/22/96	08/15/96	08/16/96	N/A
MB444022	OLD717416	WATER	07/22/96	08/15/96	08/16/96	N/A
W08156B1	MBLK01	WATER	N/A	08/15/96	08/15/96	N/A
W08156B2	MBLK02	WATER	N/A	08/15/96	08/16/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS DATA SHEET

EDB

Lab Sample ID:

.boratory Name: CH2M HILL/QAL

Concentration:

Date Extracted: 08/15/96

MB444001 Client Sample ID: OLD7174R2 Sample Matrix:

WATER Date Analyzed: 08/15/96

LOW

RB-2

Percent Moisture: _____

Dilution Factor: 1.0

CAS Number

106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 96

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL/OAL Concentration: Date Extracted: 08/15/96 LOW Lab Sample ID: MB444002 Sample Matrix: WATER Date Analyzed: 08/15/96 Client Sample ID: OLD717409 Percent Moisture: ____ Dilution Factor: 1.0

EDB

CAS Number 106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

<u>MW - 9</u>

1,1,2,2-Tetrachloroethane - SS 96

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

(334) 271-2440 Fax No. (334) 271-3428

boratory Name: CH2M HILL/QAL Concentration: LOW Date Extracted: 08/15/96
Lab Sample ID: MB444003 Sample Matrix: WATER Date Analyzed: 08/15/96
Client Sample ID: OLD71749D Percent Moisture: Dilution Factor: 1.0

<u>MW-9D</u>

EDB

<u>CAS Number</u> <u>uq/L</u> 106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 96

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

10

Laboratory Name: CH2M HILL/QAL Concentration: LOW Date Extracted: 08/15/96
Lab Sample ID: MB444004 Sample Matrix: WATER Date Analyzed: 08/15/96
Client Sample ID: OLD717417 Percent Moisture: Dilution Factor: 1.0

MW-17____

EDB

<u>CAS Number</u> <u>ug/L</u> 106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 94

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

/ NP

Lab Sample ID: MB444005 Sample Matrix: WATER Date Extracted: 08/15/96
Client Sample ID: OLD717418 Percent Moisture: Dilution Factor: 1.0

W-18____

1,1,2,2-Tetrachloroethane - SS 97

EDB

<u>CAS Number ug/L</u> 106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

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EDB

Laboratory Name: CH2M HILL/QAL Lab Sample ID:

Concentration:

LOW

Date Extracted: 08/15/96

Client Sample ID: OLD717419

MB444006

Sample Matrix: Percent Moisture: ____

WATER

Date Analyzed: Dilution Factor: 1.0

08/15/96

<u>MW-19</u>

CAS Number

106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 99

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

aboratory Name: CH2M HILL/QAL Concentration: LOW Date Extracted: 08/15/96 Lab Sample ID: MB444007 Sample Matrix: WATER Date Analyzed: 08/15/96 Client Sample ID: OLD717420 Percent Moisture: _____ Dilution Factor: ____1.0

EDB

MW-20

CAS Number 106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 99

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Laboratory Name: CH2M HILL/OAL Concentration: LOW Date Extracted: 08/15/96
Lab Sample ID: MB444008 Sample Matrix: WATER Date Analyzed: 08/15/96
Client Sample ID: OLD717421 Percent Moisture: Dilution Factor: 1.0

<u>MW-21</u>

EDB

 CAS Number
 ug/L

 106-93-4
 1,2-Dibromoethane (EDB)
 . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 101

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

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/100

Aboratory Name: CH2M HILL/QAL Concentration: LOW Date Extracted: 08/15/96
Lab Sample ID: MB444009 Sample Matrix: WATER Date Analyzed: 08/16/96
Client Sample ID: OLD717422 Percent Moisture: Dilution Factor: 1.0

MW-22____

EDB

 CAS Number
 uq/L

 106-93-4
 1,2-Dibromoethane (EDB)
 . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 100

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

/10

Laboratory Name: CH2M HILL/OAL Lab Sample ID:

MB444010

Concentration: Sample Matrix:

LOW

Date Extracted: 08/15/96

Client Sample ID: OLD717423

Percent Moisture: _

WATER

Date Analyzed: Dilution Factor: 1.0

08/15/96

MW - 23

EDB

CAS Number

106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 100

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Lab Sample ID: MB444012 Concentration: LOW Date Extracted: 08/15/96
Client Sample ID: OLD7174R1 Percent Moisture: Dilution Factor: 1.0

RB-1

EDB

<u>CAS Number ug/L</u> 106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 100

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

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EDB

Laboratory Name: CH2M HILL/OAL Lab Sample ID:

Concentration:

LOW

Date Extracted: 08/15/96

Client Sample ID: OLD717405

MB444013

Sample Matrix: Percent Moisture: ____

WATER

Date Analyzed: Dilution Factor: ____1.0

08/15/96

MW - 5

CAS Number

106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 89

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

aboratory Name: CH2M HILL/QAL

Concentration:

LOW___

Date Extracted: 08/15/96

Lab Sample ID:

MB444014 Client Sample ID: OLD71745D Sample Matrix: Percent Moisture: _____

WATER

Date Analyzed: Dilution Factor: 1.0

08/15/96

EDB

CAS Number

106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 103

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Laboratory Name: CH2M HILL/QAL Concentration: LOW Date Extracted: 08/15/96
Lab Sample ID: MB444015 Sample Matrix: WATER Date Analyzed: 08/15/96
Client Sample ID: OLD717406 Percent Moisture: Dilution Factor: ______ 1.0

EDB

•

<u>CAS Number</u> <u>uq/L</u> 106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

MW - 6

1,1,2,2-Tetrachloroethane - SS 96

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

/12

EDB

Lab Sample ID: MB444016
Client Sample ID: OLD717407

Concentration: LOW
Sample Matrix: WATER
Percent Moisture:

Date Extracted: 08/15/96
Date Analyzed: 08/15/96

Date Analyzed: 08/15/96
Dilution Factor: 1.0

MW - 7

1,1,2,2-Tetrachloroethane - SS 101

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

(334) 271-2440 Fax No. (334) 271-3428

Laboratory Name: CH2M HILL/OAL Lab Sample ID:

Concentration:

LOW WATER

Date Extracted: 08/15/96

Client Sample ID: OLD717408

MB444017

Sample Matrix:

Date Analyzed:

08/15/96

MW-8

Percent Moisture: _____

EDB

Dilution Factor: ____1.0

CAS Number

106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 94

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

EDB

Lab Sample ID:

aboratory Name: CH2M HILL/OAL

Concentration:

LOW

Date Extracted: 08/15/96

MB444018 Client Sample ID: OLD717412 Sample Matrix: Percent Moisture: _____

WATER

Date Analyzed: Dilution Factor: _____1.0

CAS Number

106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 110

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

(334) 271-2440

Laboratory Name: CH2M HILL/QAL Concentration: LOW Date Extracted: 08/15/96
Lab Sample ID: MB444019 Sample Matrix: WATER Date Analyzed: 08/15/96
Client Sample ID: OLD717413 Percent Moisture: Dilution Factor: 1.0

<u>MW-13</u>

EDB

<u>CAS Number</u> <u>uq/L</u> 106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 112

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Quality Analytical

Laboratories, Inc.

Form I

/1/

Lab Sample ID:

poratory Name: CH2M HILL/QAL MB444020

Concentration:

LOW

Date Extracted: 08/15/96 Date Analyzed:

08/15/96

Client Sample ID: OLD717414

Sample Matrix: Percent Moisture: _____

WATER

Dilution Factor: ____1.0

MW-14_

EDB

CAS Number

106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 112

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Lab Sample ID:

Laboratory Name: CH2M HILL/QAL

Concentration:

LOW

Date Extracted: 08/15/96

Client Sample ID: OLD717415

MB444021

Sample Matrix: Percent Moisture: _

WATER

Date Analyzed: Dilution Factor: _____1.0

08/16/96

MW-15

EDB

CAS Number

106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 90

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Lab Sample ID: MB444022 Concentration: LOW Date Extracted: 08/15/96
Client Sample ID: OLD717416 Percent Moisture: Dilution Factor: 1.0

MW-16

EDB

<u>CAS Number</u> <u>uq/L</u> 106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

1,1,2,2-Tetrachloroethane - SS 91

Comments:

Form I

/\^U

Laboratory Name: CH2M HILL/OAL Concentration: LOW Date Extracted: 08/15/96
Lab Sample ID: W08156B1 Sample Matrix: WATER Date Analyzed: 08/15/96
Client Sample ID: MBLK01 Percent Moisture: Dilution Factor: 1.0

EDB

CAS Number ug/L
106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 98

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

100

Lab Sample ID: W08156B2 Sample Matrix: WATER Date Extracted: 08/15/96
Client Sample ID: MBLK02 Percent Moisture: Dilution Factor: 1.0

EDB

<u>CAS Number uq/L</u> 106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 105

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

(334) 271-2440

GC POLYNUCLEAR AROMATIC HYDROCARBONS

CASE NARRATIVE GC POLYNUCLEAR AROMATIC HYDROCARBONS

QAL	Lab	Refer	ence	No./SDG.	MB444	 	 _	
Prof	ect:	ABB	UST	527	_	 		

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

- A. Sample Preparation: Sample MB444015 was re-extracted (MB444015RE) out of holding time. All other holding times were met.
- B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A Cleanup: N/A Analysis: EPA 610

IV. PREPARATION

Entire contents of sample container were extracted per method. Actual volumes are shown on Form I's. Sample MB444015 was re-extracted outside of holding time to investigate low surrogate recovery. Both MB444015 and MB444015RE are reported with this contract. All other sample preparation proceeded normally.

V. ANALYSIS

- A. Calibration: All acceptance criteria were met.
- B. Blanks: All acceptance criteria were met.
- C. Surrogates: Surrogate recovery for sample MB444015 exceeded QC limits. MB444015 was re-extracted (MB444015RE) to investigate. All other acceptance criteria were met.
- D. Spikes: Spikes were performed at the method specified frequency. Results are not included in this reporting level.
- E. Samples: Sample analyses proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: (ammy	Cácen	DATE:	8/16/96	
Tammy Carey / Chemist	1			

GC POLYNUCLEAR AROMATIC HYDROCARBONS
Lab Reference No./SDG: MB444
Page 2

CASE NARRATIVE Addendum

Sample Information

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLE <u>MATRIX</u>	DATE SAMPLED	DATE EXTRACTED	DATE <u>ANALYZED</u>	SAMPLE pH ¹
MB444001	OLD7174R2	WATER	07/23/96	07/25/96	08/06/96	N/A
MB444002	OLD717409	WATER	07/23/96	07/25/96	08/06/96	N/A
MB444003	OLD71749D	WATER	07/23/96	07/25/96	08/06/96	N/A
MB444004	OLD717417	WATER	07/23/96	07/25/96	08/06/96	N/A
MB444005	OLD717418	WATER	07/23/96	07/25/96	08/06/96	N/A
MB444006	OLD717419	WATER	07/23/96	07/25/96	08/06/96	N/A
MB444007	OLD717420	WATER	07/23/96	07/25/96	08/07/96	N/A
MB444008	OLD717421	WATER	07/23/96	07/25/96	08/07/96	N/A
MB444009	OLD717422	WATER	07/23/96	07/25/96	08/07/96	N/A
MB444010	OLD717423	WATER	07/23/96	07/25/96	08/07/96	N/A
MB444012	OLD7174R1	WATER	07/22/96	07/26/96	08/07/96	N/A
MB444013	OLD717405	WATER	07/22/96	07/26/96	08/07/96	N/A
MB444014	OLD71745D	WATER	07/22/96	07/26/96	08/07/96	N/A
MB444015	OLD717406	WATER	07/22/96	07/26/96	08/07/96	N/A
MB444015RE	OLD717406RE	WATER	07/22/96	08/08/96	08/12/96	N/A
MB444016	OLD717407	WATER	07/22/96	07/26/96	08/07/96	N/A
MB444017	OLD717408	WATER	07/22/96	07/26/96	08/07/96	N/A
MB444018	OLD717412	WATER	07/22/96	07/26/96	08/07/96	N/A
MB444019	OLD717413	WATER	07/22/96	07/26/96	08/07/96	N/A
MB444020	OLD717414	WATER	07/22/96	07/26/96	08/07/96	N/A
MB444021	OLD717415	WATER	07/22/96	07/26/96	08/07/96	N/A
MB444022	OLD717416	WATER	07/22/96	07/26/96	08/07/96	N/A
W07256B1	NBLK01	WATER	N/A	07/25/96	08/06/96	N/A
W07266B1	NBLK02	WATER	N/A	07/26/96	08/07/96	N/A
W08086B1	NBLK03	WATER	N/A	08/08/96	08/12/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/25/96
Lab Sample ID: MB444001 Sample Matrix: WATER Date Analyzed: 08/06/96
Tient Sample ID: OLD7174R2 Volume Extracted: 1005mL Dilution Factor: 1.0

RB-2

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	Ū
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k) fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	<pre>Indeno(1,2,3-cd)pyrene</pre>	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	72	¥

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/25/96 Lab Sample ID: MB444002 Sample Matrix: WATER Date Analyzed: 08/06/96 Client Sample ID: OLD717409 Volume Extracted: 1040mL Dilution Factor: ____1.0 <u> MW-9</u>

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	Ŭ
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	Ū
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b)fluoranthene	2	U
207-08-9	Benzo(k) fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	Ü
193-39-5	<pre>Indeno(1,2,3-cd)pyrene</pre>	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	82	ક

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/25/96 Lab Sample ID: MB444003 Sample Matrix: WATER Date Analyzed: 08/06/96 'ient Sample ID: OLD71749D Volume Extracted: 1040mL Dilution Factor: ____ MW-9D

PNA COMPOUNDS

CAS Number		uq/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	Ū
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	<pre>Indeno(1,2,3-cd)pyrene</pre>	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	 65	ક

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/25/96
Lab Sample ID: MB444004 Sample Matrix: WATER Date Analyzed: 08/06/96
Client Sample ID: OLD717417 Volume Extracted: 1005mL Dilution Factor: 1.0
MW-17

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	2	Ū
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	77	ક

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW

Lab Sample ID: MB444005 Sample Matrix: WATER

lient Sample ID: OLD717418 Volume Extracted: 1030mL

Sample Matrix: WATER Date Analyzed: 08/06/96
Volume Extracted: 1030mL Dilution Factor: 1.0

Date Extracted: 07/25/96

<u>MW-18</u>

PNA COMPOUNDS

CAS Number		uq/L	
91-20-3	Naphthalene	2	ָ
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	Ū
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	υ
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b)fluoranthene	2	U
207-08-9	Benzo(k) fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	66	ક

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/25/96
Lab Sample ID: MB444006 Sample Matrix: WATER Date Analyzed: 08/06/96
Client Sample ID: OLD717419 Volume Extracted: 1050mL Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b)fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	บ
193-39-5	Indeno(1,2,3-cd)pyrene	2	U
53-70-3	Dibenzo(a,h) anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	50	ક

MW-19

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/25/96

Lab Sample ID: MB444007 Sample Matrix: WATER Date Analyzed: 08/07/96

ient Sample ID: OLD717420 Volume Extracted: 1035mL Dilution Factor: 1.0

MW-20

PNA COMPOUNDS

CAS Number		uq/L	
91-20-3	Naphthalene	2	Ū
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	58	ક

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/25/96
Lab Sample ID: MB444008 Sample Matrix: WATER Date Analyzed: 08/07/96
Client Sample ID: OLD717421 Volume Extracted: 1020mL Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		uq/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k) fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	77	*

Comments:

Form I

14

000091

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/25/96
Lab Sample ID: MB444009 Sample Matrix: WATER Date Analyzed: 08/07/96
Lient Sample ID: OLD717422 Volume Extracted: 990mL Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		uq/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	Ŭ
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55 - 3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	Ū
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	47	ક

MW-22

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

CH2M HILL Concentration: Laboratory Name: LOW___ Date Extracted: Lab Sample ID: MB444010 Sample Matrix: Date Analyzed: WATER_ Client Sample ID: OLD717423 Volume Extracted: 1050mL Dilution Factor: 1.0

MW-23

PNA COMPOUNDS

CAS Number		uq/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86 <i>-</i> 73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a)anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b)fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	<pre>Indeno(1,2,3-cd)pyrene</pre>	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	83	ક

Comments:

Form I

07/25/96 08/07/96

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/26/96

Lab Sample ID: MB444012 Sample Matrix: WATER Date Analyzed: 08/07/96

ient Sample ID: OLD7174R1 Volume Extracted: 900mL Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		uq/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	σ
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	71	*

RB-1

Comments:

Form I

1,00

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/26/96
Lab Sample ID: MB444013 Sample Matrix: WATER Date Analyzed: 08/07/96
Client Sample ID: OLD717405 Volume Extracted: 970mL Dilution Factor: 1.0
MW-5

PNA COMPOUNDS

CAS Number		ug/L	_
91-20-3	Naphthalene	19	
91-57-6	2-Methylnaphthalene	6	
90-12-0	1-Methylnaphthalene	3	
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b)fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	Ū
	Terphenyl-d14 - SS	53	ક

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/26/96
Lab Sample ID: MB444014 Sample Matrix: WATER Date Analyzed: 08/07/96
ient Sample ID: OLD71745D Volume Extracted: 1030mL Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		uq/L	
91-20-3	Naphthalene	21	_
91-57 - 6	2-Methylnaphthalene	7	
90-12-0	1-Methylnaphthalene	5	
208-96-8	Acenaphthylene	2	Ū
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k) fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	<pre>Indeno(1,2,3-cd)pyrene</pre>	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	52	ક

MW - 5D

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: <u>LOW</u> Date Extracted: 07/26/96 Lab Sample ID: WATER MB444015 Sample Matrix: Date Analyzed: Client Sample ID: OLD717406 Volume Extracted: 1030mL Dilution Factor: ____1.^ MW - 6

PNA COMPOUNDS

CAS Number		uq/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	31	ક

Comments:

Form I

08/07/96

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 08/08/96
Lab Sample ID: MB444015RE Sample Matrix: WATER Date Analyzed: 08/12/96
lient Sample ID: OLD717406RE Volume Extracted: 1039mL Dilution Factor: 1.0
MW-6RE

PNA COMPOUNDS

CAS Number		uq/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73 <i>-</i> 7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b)fluoranthene	2	U
207-08-9	Benzo(k) fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	υ
	Terphenyl-d14 - SS	85	ક

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Lab Sample ID: MB444016 Client Sample ID: OLD717407

MW - 7

Concentration: Sample Matrix: LOW WATER_ Date Extracted: 07/26/96 Date Analyzed:

08/07/96

Volume Extracted: 1040mL Dilution Factor: ____1.

PNA COMPOUNDS

CAS Number		uq/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene	2	Ŭ
53-70-3	Dibenzo(a,h)anthracene	2	Ū
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	82	ક

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/26/96
Lab Sample ID: MB444017 Sample Matrix: WATER Date Analyzed: 08/07/96
ient Sample ID: OLD717408 Volume Extracted: 1010mL Dilution Factor: 1.0

MW - 8

PNA COMPOUNDS

<u>CAS Number</u>		<u>uq/L</u>	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	Ū
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55 - 3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k) fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	<pre>Indeno(1,2,3-cd)pyrene</pre>	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	ט
	Terphenvl-dl4 - SS	71	ક

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

CH2M HILL Laboratory Name: Concentration: LOW Date Extracted: 07/26/96 Lab Sample ID: MB444018 Sample Matrix: WATER Date Analyzed: 08/07/96 Client Sample ID: OLD717412 Volume Extracted: 1010mL Dilution Factor: ____1.0 MW-12

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	21	
91-57-6	2-Methylnaphthalene	8	
90-12-0	1-Methylnaphthalene	3	
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	Ŭ
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	<pre>Indeno(1,2,3-cd)pyrene</pre>	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	63	용

- U Analyzed for but not detected.
- B Detected in QC blank.
- J Detected, concentration estimated.
- SS Surrogate Standard reported as percent recovery.

Comments:

Form I

سرارك

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/26/96
Lab Sample ID: MB444019 Sample Matrix: WATER Date Analyzed: 08/07/96
ient Sample ID: OLD717413 Volume Extracted: 980mL Dilution Factor: 1.0

PNA COMPOUNDS

<u>CAS Number</u>		ug/L	_
91-20-3	Naphthalene	3	
91-57-6	2-Methylnaphthalene	3	
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	<pre>Indeno(1,2,3-cd)pyrene</pre>	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	82	g.

MW-13

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/26/96 Lab Sample ID: MB444020 Sample Matrix: WATER_ Date Analyzed: 08/07/96 Client Sample ID: OLD717414 Volume Extracted: <u>950mL</u> Dilution Factor: ____1.0 <u>MW-14</u>

PNA COMPOUNDS

CAS Number		uq/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	Ū
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73 - 7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a)anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	υ
	Terphenyl-d14 - SS	80	*

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/26/96
Lab Sample ID: MB444021 Sample Matrix: WATER Date Analyzed: 08/07/96
'ient Sample ID: OLD717415 Volume Extracted: 1020mL Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number	22222	uq/L	_
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	Ŭ
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a)anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b)fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	<pre>Indeno(1,2,3-cd)pyrene</pre>	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	74	ક

MW-15

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/26/96
Lab Sample ID: MB444022 Sample Matrix: WATER Date Analyzed: 08/07/96
Client Sample ID: OLD717416 Volume Extracted: 1050mL Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number	<u> </u>	ug/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	80	*

MW-16

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/25/96

Lab Sample ID: W07256B1 Sample Matrix: WATER Date Analyzed: 08/06/96

lient Sample ID: NBLK01 Volume Extracted: 1000mL Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		uq/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73 - 7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	Ū
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	<pre>Indeno(1,2,3-cd)pyrene</pre>	2	U
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	80	ક

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/26/96
Lab Sample ID: W07266B1 Sample Matrix: WATER Date Analyzed: 08/07/96
Client Sample ID: NBLK02 Volume Extracted: 1000mL Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k) fluoranthene	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene	2	บ
53-70-3	Dibenzo(a,h)anthracene	2	U
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	57	ક

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 08/08/96

Lab Sample ID: W08086B1 Sample Matrix: WATER Date Analyzed: 08/12/96

ient Sample ID: NBLK03 Volume Extracted: 1000mL Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene	2	U
90-12-0	1-Methylnaphthalene	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	บ
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	Ū
56-55-3	Benzo(a) anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b) fluoranthene	2	U
207-08-9	Benzo(k)fluoranthene	2	U
50-32-8	Benzo(a) pyrene	2	U
193 <i>-</i> 39-5	<pre>Indeno(1,2,3-cd)pyrene</pre>	2	Ū
53-70-3	Dibenzo(a,h)anthracene	2	Ū
191-24-2	Benzo(g,h,i)perylene	2	U
	Terphenyl-d14 - SS	82	ક

Comments:

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

CATIONS

CASE NARRATIVE Cations

Labor	atory	: CH2M HILL Lab Ref. No: MB444
Clien	nt/Pro	ject: ABB UST 527
I.		ing Time: holding times were met.
II.	<u>Dige:</u> None	stion Exceptions:
III.	Anal	ysis:
	A.	<u>Calibration</u> : All acceptance criteria were met.
	В.	Blanks: All acceptance criteria were met.
	C.	ICP Interference Check Sample: All acceptance criteria were met.
	D.	<pre>Spike Sample(s): All acceptance criteria were met.</pre>
	E.	<pre>Duplicate Sample(s): All acceptance criteria were met.</pre>
	F.	<u>Laboratory Control Sample(s)</u> : All acceptance criteria were met.
	G.	<pre>ICP Serial Dilution: Not required for this level QC.</pre>
	н.	Other: None.
IV.	Any :	ipt Exceptions: receipt exceptions will be addressed in a Sample Receipt Exception rt which will be attached to the Chain-of-Custody in this package.
v.	<u>Docur</u> None	mentation Exceptions:

VI. I certify that this data package is in compliance with the terms and conditions agreed to by the client and Quality Analytical Laboratories, Inc., both technically and for completeness, except for the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

SIGNED: Kay Walke DATE: 8/13/96

Kaye Walker

Inorganic_Division_Manager

Client Sample ID: OLD7174R2 Sample Description: RB-2 Sample Matrix: Water

Date Collected: 07/23/96 (Tuesday) Date Received: 07/25/96 (Thursday) Lab Reference No: MB444 Lab Sample ID: MB444001

CATEGORY NAME Analytical Parameter		Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
CATIONS Lead		< 3.0	ug/L	3.0	08/08/96	EPA239.2/SW7421

Client Sample ID: OLD717409 Sample Description: MW-9 Sample Matrix: Water Date Collected: 07/23/96 (Tuesday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444002

CATEGORY NAME Analytical Parameter	· -	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
CATIONS Lead		8.8	ug/L	3.0	08/08/96	EPA239.2/SW7421

Client Sample ID: OLD71749D Sample Description: MW-9D

Sample Matrix: Water

Date Collected: 07/23/96 (Tuesday) Date Received: 07/25/96 (Thursday) Lab Reference No: MB444 Lab Sample ID: MB444003

CATEGORY NAME Analytical Parameter		Result	Units	Reporting Level		Analytical Method(s)
CATIONS Lead		5.4	ug/L	3.0	08/08/96	EPA239.2/SW7421
	• • • • • • • • • • • • • • • • • • •					

Client Sample ID: OLD717417 Sample Description: MW-17 Sample Matrix: Water Date Collected: 07/23/96 (Tuesday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444004

CATEGORY NAM Analytical Param	Result	Units	Reporting Level		Analytical Method(s)
CATIONS Lead	4.8	ug/L	3.0	08/08/96	EPA239.2/SW7421

Client Sample ID: OLD717418 Sample Description: MW-18

Sample Matrix: Water

Date Collected: 07/23/96 (Tuesday) Date Received: 07/25/96 (Thursday) Lab Reference No: MB444 Lab Sample ID: MB444005

CATEGORY NAME nalytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
CATIONS ead	29.3	ug/L	3.0	08/08/96	EPA239.2/SW7421
					¥
				•••	

Client Sample ID: OLD717419 Sample Description: MW-19

Date Collected: 07/23/96 (Tuesday) Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444006

Sample Matrix: Water

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
CATIONS Lead	9.8	ug/L	3.0	08/08/96	EPA239.2/SW7421

Client Sample ID: OLD717420 Sample Description: MW-20

Sample Matrix: Water

Date Collected: 07/23/96 (Tuesday) Date Received: 07/25/96 (Thursday) Lab Reference No: MB444 Lab Sample ID: MB444007

CATEGORY NAME Analytical Parameter	 Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
CATIONS Lead	11.1	ug/L	3.0	08/08/96	EPA239.2/SW7421
					·

Client Sample ID: OLD717421 Sample Description: MW-21

Sample Matrix: Water

Date Collected: 07/23/96 (Tuesday) Date Received: 07/25/96 (Thursday) Lab Reference No: MB444 Lab Sample ID: MB444008

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
CATIONS .ead	30.3	ug/L	3.0	08/08/96	EPA239.2/SW7421



Client Sample ID: OLD717422 Sample Description: MW-22 Sample Matrix: Water

Date Collected: 07/23/96 (Tuesday) Date Received: 07/25/96 (Thursday) Lab Reference No: MB444 Lab Sample ID: MB444009

CATEGORY NAME Analytical Parameter		Result	Units	Reporting Level		Analytical Method(s)
CATIONS Lead		84.9	ug/L	3.0	08/08/96	EPA239.2/SW7421
	en e					

Client Sample ID: OLD717423 Sample Description: MW-23 Sample Matrix: Water Date Collected: 07/23/96 (Tuesday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444010

CATEGORY NAME Analytical Paramet	er	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
CATIONS Lead		88.8	ug/L	3.0	08/08/96	EPA239.2/SW7421

Client Sample ID: OLD7174R1 Sample Description: RB-1 Sample Matrix: Water

Date Collected: 07/22/96 (Monday) Date Received: 07/25/96 (Thursday) Lab Reference No: MB444 Lab Sample ID: MB444012

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
CATIONS .ead	< 3.0	ug/L	3.0	08/08/96	EPA239.2/SW7421
• • • • • • • • • • • • • • • • • • •					

Client Sample ID: OLD717405 Sample Description: MW-5 Sample Matrix: Water

Date Received: 07/25/96 (Monday)

Lab Reference No: MB444

Lab Sample ID: MR444

Lab Sample ID: MB444013

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
CATIONS Lead	21.0	ug/L	3.0	08/08/96	EPA239.2/SW7421

Client Sample ID: OLD71745D Sample Description: MW-5D

Sample Matrix: Water

Date Collected: 07/22/96 (Monday) Date Received: 07/25/96 (Thursday) Lab Reference No: MB444 Lab Sample ID: MB444014

CATEGORY NAME nalytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
CATIONS ead	17.9	ug/L	3.0	08/08/96	EPA239.2/SW7421

Client Sample ID: OLD717406 Sample Description: MW-6

Sample Matrix: Water

Date Collected: 07/22/96 (Monday) Date Received: 07/25/96 (Thursday) Lab Reference No: MB444

L	.ab	Sample	ID:	MB444015

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
CATIONS Lead		ug/L	3.0	08/08/96	EPA239.2/SW7421
					· · · · · ·

Client Sample ID: OLD717407 Sample Description: MW-7 Sample Matrix: Water Date Collected: 07/22/96 (Monday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444016

CATEGORY NAME Analytical Parameter	Result	Units	eporting Level	Date of Analysis	Analytical Method(s)
CATIONS Lead	16.0	ug/L	3.0	08/08/96	EPA239.2/SW7421
					٠
				•	

Client Sample ID: OLD717408 Sample Description: MW-8
Sample Matrix: Water

Date Collected: 07/22/96 (Monday) Date Received: 07/25/96 (Thursday) Lab Reference No: MB444 Lab Sample ID: MB444017

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Analytical Method(s)
CATIONS Lead	12.7	ug/L	3.0	EPA239.2/SW7421



Client Sample ID: OLD717412 Sample Description: MW-12 Sample Matrix: Water Date Collected: 07/22/96 (Monday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444018

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
CATIONS Lead	30.9	ug/L	3.0	08/08/96	EPA239.2/SW7421

Client Sample ID: OLD717413 Sample Description: MW-13 Sample Matrix: Water Date Collected: 07/22/96 (Monday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444019

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
CATIONS Lead	61.4	ug/L	3.0	08/08/96	EPA239.2/SW7421

Client Sample ID: OLD717414 Sample Description: MW-14

Sample Matrix: Water

Date Collected: 07/22/96 (Monday) Date Received: 07/25/96 (Thursday) Lab Reference No: MB444 Lab Sample ID: MB444020

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
CATIONS Lead	5.5	ug/L	3.0	08/08/96	EPA239.2/SW7421
. <u></u>					

Client Sample ID: OLD717415 Sample Description: MW-15

Sample Matrix: Water

Date Collected: 07/22/96 (Monday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444021

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
CATIONS .ead	16.2	ug/L	3.0	08/08/96	EPA239.2/SW7421
				•	

Client Sample ID: OLD717416 Sample Description: MW-16 Sample Matrix: Water

Date Collected: 07/22/96 (Monday) Date Received: 07/25/96 (Thursday) Lab Reference No: MB444 Lab Sample ID: MB444022

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
CATIONS Lead	21.7	ug/L	3.0	08/08/96	EPA239.2/SW7421

Client Sample ID: METHOD BLANK Sample Description: None

le Description: None Sample Matrix: Water Date Collected: None Date Received: None Lab Reference No: LABQC Lab Sample ID: Various

CATEGORY NAME analytical Parameter	Result	Units	Reporting Level	Analytical Method(s)
CATIONS ead	< 3.0	ug/L	3.0	EPA239.2/SW7421

(6672)

GENERAL CHEMISTRY

CASE NARRATIVE GENERAL CHEMISTRY

QAL	Lab	Reference	No./SDG.	MB444

Project: ABB UST 527

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

All holding times were met.

III. METHOD

The method used is cited in the corresponding Form I.

IV. PREPARATION

Sample preparation proceeded normally, if applicable.

V. ANALYSIS

- A. Calibration: All acceptance criteria were met.
- B. Blanks: All acceptance criteria were met.
- C. Spikes: All acceptance criteria were met.
- D. Duplicates: All acceptance criteria were met.
- E. Laboratory Control Samples: All acceptance criteria were met.
- F. Samples: Sample analyses proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED:

Velinda Herbert

General Organic/Inorganic Chemist

Client Sample ID: OLD7174R2 Sample Description: RB-2 Sample Matrix: Water

Date Collected: 07/23/96 (Tuesday) Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	< 0.05	mg/L	0.05	08/13/96	EPA418.1
• • • • • • • • • • • • • • • • • • •					
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					_ ^ \

Client Sample ID: OLD717409 Sample Description: MW-9 Sample Matrix: Water Date Collected: 07/23/96 (Tuesday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444002

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	0.16	mg/L	0.05	08/13/96	EPA418.1

(6719)

Client Sample ID: OLD71749D Sample Description: MW-9D Sample Matrix: Water

Date Received: 07/25/96 (Tuesday)

Lab Reference No: MB444

Lab Sample ID: MR444 Date Collected: 07/23/96 (Tuesday)

CATEGORY NAME Analytical Parameter	Result	Units		Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	0.12	mg/L	0.05		

Client Sample ID: OLD717417 Sample Description: MW-17

Date Collected: 07/23/96 (Tuesday) Date Received: 07/25/96 (Thursday) Lab Reference No: MB444 Lab Sample ID: MB444004

Sample Matrix: Water

CATEGORY NAME Reporting Date of Analytical Result Units Level Analysis Method(s) Analytical Parameter DEMAND AND GENERAL ORGANIC 0.05 08/13/96 EPA418.1 < 0.05 mg/L Total Petroleum Hydrocarbons

Client Sample ID: OLD717418

Sample Description: MW-18 Sample Matrix: Water

Total Petroleum Hydrocarbons

Date Received: 07/23/96 (Tuesday)

Lab Reference No: MB444

Lab Sample ID: MR444

mg/L

Lab Sample ID: MB444005

0.05 08/13/96 EPA418.1

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Analytical Method(s)	
DEMAND AND GENERAL ORGANIC			-		

< 0.05

Client Sample ID: OLD717419
Sample Description: MW-19

Date Collected: 07/23/96 (Tuesday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444006

Sample Matrix: Water

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	0.08	mg/L	0.05	08/13/96	EPA418.1

(6719)

Client Sample ID: OLD717420 Sample Description: MW-20 Sample Matrix: Water

Date Collected: 07/23/96 (Tuesday)

Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444

Lab Sample ID: MB444007 Date Collected: 07/23/96 (Tuesday)

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	< 0.05	mg/L	0.05	08/13/96	EPA418.1

Client Sample ID: OLD717421 Sample Description: MW-21 Sample Matrix: Water Date Collected: 07/23/96 (Tuesday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444008

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	< 0.05	mg/L	0.05	08/13/96	EPA418.1

(6)19)

Client Sample ID: OLD717423 Sample Description: MW-23 Sample Matrix: Water

Date Collected: 07/23/96 (Tuesday) Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444010

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	< 0.05	mg/L	0.05	08/13/96	EPA418.1

Client Sample ID: OLD7174R1 Sample Description: RB-1 Sample Matrix: Water Date Collected: 07/22/96 (Monday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444012

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	< 0.05	mg/L	0.05	08/13/96	EPA418.1
					•

Client Sample ID: OLD717405 Sample Description: MW-5 Sample Matrix: Water Date Collected: 07/22/96 (Monday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444013

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	0.14	mg/L	0.06	08/13/96	EPA418.1
					•
				•	

(6719)

Client Sample ID: OLD71745D Sample Description: MW-5D Sample Matrix: Water

Date Received: 07/25/96 (Monday)

Lab Reference No: MB444

Lab Sample ID: MRAAAA Date Collected: 07/22/96 (Monday)

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	0.34	mg/L	0.06	08/13/96	EPA418.1

Client Sample ID: OLD717406 Sample Description: MW-6 Sample Matrix: Water

Date Received: U7/22/96 (Monday)

Date Received: U7/25/96 (Thursday)

Lab Reference No: MB444

Lab Sample ID: MR444 Date Collected: 07/22/96 (Monday)

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	0.25	mg/L	0.05	08/13/96	EPA418.1

Client Sample ID: OLD717407 Sample Description: MW-7

mple Description: MW-7
Sample Matrix: Water

Date Collected: 07/22/96 (Monday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444016

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC otal Petroleum Hydrocarbons	0.32	mg/L	0.06	08/13/96	EPA418.1

Client Sample ID: OLD717408 Sample Description: MW-8

Sample Matrix: Water

Date Collected: 07/22/96 (Monday) Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444017

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC otal Petroleum Hydrocarbons	0.28	mg/L	0.05	08/13/96	EPA418.1
·					

Client Sample ID: OLD717412 Sample Description: MW-12

Date Collected: 07/22/96 (Monday)

Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444

Lab Sample ID: MB4440

Lab Sample ID: MB444018

Sample Matrix: Water

CATEGORY NAME Analytical Parameter	Result	Units	, ,		Analytical Method(s)	
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	0.30	mg/L	0.05	08/13/96	EPA418.1	

Client Sample ID: OLD717413 Sample Description: MW-13 Sample Matrix: Water

Date Received: 07/25/96 (Monday)

Lab Reference No: MB444

Lab Sample ID: MR444

DEMAND AND GENERAL ORGANIC otal Petroleum Hydrocarbons	0.44	mg/L			
		mg/ L	0.05	08/13/96	EPA418.1
· ————————————————————————————————————					

Client Sample ID: OLD717414 Sample Description: MW-14 Sample Matrix: Water

Date Received: 07/22/96 (Monday)

Lab Reference No: MB444

Lab Sample ID: MB444

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	0.30	mg/L	0.05	08/13/96	EPA418.1

Client Sample 10: OLD717416
Sample Description: MW-16
Sample Matrix: Water

Date Collected: 07/22/96 (Monday)
Date Received: 07/25/96 (Thursday)

Lab Reference No: MB444 Lab Sample ID: MB444022

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	0.32	mg/L	0.06	08/13/96	EPA418.1

(6719)

Sample Description: None
Sample Matrix: Water

Date Collected: None Date Received: None Lab Reference No: LABQC

Lab Sample ID: Various

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level		Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	< 0.05	mg/L	0.05	08/13/96	EPA418.1

Chain of custody documentation.



CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

Project #	Purchase Order	r#	□LG			□LRD	TI	IIS AREA FOR I	AB USE O	NLY
8519 - 42			One In	novation Drive, S a. FL 32615-958		5090 Caterpillar Road Redding, CA 96003-1412	Lab#		Page	of
Project Name				162-3050 FAX (9		(916) 244-5227 FAX (916) 244	4109 MB	44 4		
NTCOVIN	rdo-7174		EXTN	AG Fairlane Drive		Canviro Analytical Laboratories,	Client	<u> </u>	Price Sou	rce
			Montgo	omery, AL 36116 271-2440 FAX (2		50 Bathurst, Unit 12 Waterloo, Ontario, Canada N2V			APQ	S
ABB Environ	neutal Service	હ	(203) 2	271-2440 FAX (4	203) 27 1-3426	(519) 747-2575 FAX (519) 747	3806	· .	7-10	
1 ~ i	& Phone # Report Copy to:				ANALYSE	S REQUESTED	Acct Co	ode	Test Grou	P
John 407-895-8	1845 Manuel A	temso			23	\$\alpha \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	AB	3		
Requested Completion Date:	Site ID	Sample Disposal:	ř	+741185	(44#)	(60)	Project	Code	Ack. Gen.	•
8-13-96	7174	Dispose Return	CON	10		\ '\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		3 UST 5	27	
Type Matr	x	1		2 0	019	50d 239	LIMSV	er <i>30</i>	Login	Mult.
Sampling C G W S	CLIENT SAMPLE ID	QCID	N E	443			COC R	eview ///	101	
Sampling C G R A C M A T P B R	(9 CHARACTERS)	(3 CHAR)	RS	7	84	694 694	SAMF	PLE REMARKS	LAB 1 ID	LAB 2 ID
7-23-94 XX	0LD7174	R2	12	3 3	21	21		B-2	01	
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1000	0407174	17	12	3 3	21	21	1	1w-17	04	
1/00	0 L D 7 1 7 4	18	12	3 3 3 3	2 1	2 1	M	w-18	05	
1305	0607174	19	12		2 1	21	<u>M</u>	w-19	06	
1235	0407174	20	12	3 3	21	21	M	w-20	07	
1215	0107174	21	12	3 3	210	21	M	w-21	08	
1148	0LD7174	22	12	3 3	2/0	2 1	M	v-22	09	
(V 1125	0407174	23	12	3 3		2 1	Mu	0-23	10	
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Revived By A (Please si	(POI) 7-	23-96 Date/Time	Relinguis	shed By	(Please sign and print na	COTT DONELICK)	7/23/96 Date/Time	EDATA:	Y	$\overline{\mathcal{C}}$
David Sking 7/24/96 09:30A			ं .				QC LEVEL	2 3 OTHE	R	
Received By (Please sign and print name) Date/Time F		Relinquis	shed By	(Please sign and print na	ame)	Date/Time		Ice		
Received By (Please si	gn and print name)	Date/Time	Shipped UPS		Other	Shipping # 9699	38616	pH Custody		
Batch Remarks:			3,3	ا رساسی	/ III	- 07671	70010	Seal	Temp	



QUALITY ANALYTICAL LABORATORIES, INC.

* TRIP BLANK INCLUDED TO BE ANALYZED FOR EPA 601 and 602

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

Project # Purchase Order # LGN DLRD						THIS AREA FOR L	AB USE OI	NLY	
8519-42		One	Innovation Drive, S		5090 Caterpillar Road Redding, CA 96003-1412	Lai	ь # ЛІ (ЗШЛД.)	Page	of
Project Name		(904)	462-3050 FAX ((916) 244-5227 FAX (916) 24	4-4109	nauus		1
NTC Orlando - 7174		567	.MG Fairlane Drive		Canviro Analytical Laboratorie	Clie	ient Service	Price Sou	rce
Company Name		Mont	gomery, AL 36116 271-2440 FAX (50 Bathurst, Unit 12 Waterloo, Ontario, Canada N2			APQ	S
ABB-Environmental Sen Project Manager or Contact & Phone # Report Co	ICES	,/		· · · · · · · · · · · · · · · · · · ·	(519) 747-2575 FAX (519) 74	47-3806	ct Code	Test Grou	<u></u>
Project Manager or Contact & Phone # Report Co	py to:		11.		ES REQUESTED			rest Grou	P
Kuyer (407)895-8545 Manuel	O LAMPA		MIBE	(FAH)) 80 B		ABB	! !	
Requested Completion Date: Site ID	Sample Disposal:	 	1	3 5	16/08		oject Code	Ack. Gen.	
8-13-96 7174	Dispose Return	0 N	7 7	-610 (1	ABB UST 52	7	
Type Matrix		┤ ┇	109	£ 6	39.	LIN	MS Ver	Login	Mult.
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Date Time P B R L (9 CHARACTE	ERS) (3 CHAR)	A S	五五	77 H	F74 F24	S	SAMPLE REMARKS	LAB 1 ID	LAB 2 ID
7-12-96001 XX OLD717	4 R I	12	3 3	2 1	2 1		RB-1	12	
1 1025 11 0 4 0 7 17	405	12	3 3	2 1	2 1		MW-5	13	
V025 1 0 L D 7 1 7	45D	12	3 3	2 1	2 1		MW-5D	14	
1/02 0 L D 7 1 7	406	12	3 3	2 1	121		MW-6	j5	
1130 040717	407	12	3 3	2 1	ノンクリ		µw-7	16	
1 1210 1 1 0 L D 7 1 7	408	12	3 3	2 1	21		mw-8	17	
1320 0 D 7 1 7	412	12	3 3	2 1	21		MW-12	18	
1348 11 OLD 717	4 1 3	12	3 3	21	2 1		MW-13	19	
1420 DLD717	414	12	3 3 3 3	121	21		MW-14	20	
140 0 LD717	415	12	3 3	2 10	2 1		MW-15	21	, i
VISIO MY OLD 7 17	416	12	33	2 1	2 1		MW-16	22	
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Received By / (Please sign and print name)	Pate/Time	Relingu	uished By	(Please sign and print	MT DONEUCK)	7/23/96 Date/Time	EDATA:	Y	(B)
Balle Devel	1/24/96 0930		detect D		· · · · · · · · · · · · · · · · · · ·	D-4: 77	OC LEVEL (1)	3 OTHE	R
Received By (Please sign and print name) Date/Time Relinquished By (Please sign and print name) Date/Time pH Ice									
Received By (Please sign and print name)	0.7.								
Balch Remarks:									

Batch Number:	MB 444	Date received: 7/24/96
- Client/Project:	ABBINITY Orlando	.2.4

Observation	YES	NO
Were custody seals intact and on the outside of the cooler?		
Was the Chain of Custody inside the cooler?	V	
Was the Chain of Custody properly filled out?	ν	
Were the sample containers in good condition?		
Was there ice in the cooler? Enter temperature of temperature blank or icewater:	4°C V	

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report must be writen.

Sample No	N OF SAMPL Nutrients pil < 2	Metais	Volatiles pil < 2	Cyanide pli > 12	Other (specify)	Other (specify)
01		1462	9H < 2		9462	
02		1462	PHCZ		9462	<u>:</u>
03		PHZZ	PHLZ		PHC2	
04		PHCZ	PH 62		1442	
05		PHCZ	PHLZ		PHLZ	
06		PHZZ	PH42		PH < 2	
07		PHEZ	PHLZ		1442	
08		1462	PHLZ		1462 1462	
09		1442	1442		PHCZONS	
10		PH < 2	PHED		PH < 2	
11			PHLZ			
12		PH<2	PHLZ		1462	
13		1462	PHLZ		PH < 2	
14		1462	PHCO		PHC2	
15		1442	PHLO		PHCZ	
16		PHLZ	1462		PHCZ	
17		PH 2	PHLO		PHCZ	
18		PHC2	PHLZ		PH L2	
19		1442	1462		PHLA	
20		8462	PHCZ		1460	ļ
21		9422	PHCA	<u> </u>	4440004	ļ
22		PH 22	8H<2		PH 62	ļ
23				<u> </u>	·	<u> </u>
24						
25						

^ 4		LOGIN AND PH VERIFIC	ATIONS PERFORM	ED BY	
6 - /	_ 1	-11.	2.		
David	Shul.	7/24/96			Uale
$\overline{\nabla}$		Date			

HCE(601) ARE(602) 7/22 HG-7/23/46

						Samp	ie Ke	ceipt l	Exception	s Report
Batc	h Number:	МВН	144			Origination	n date:	יבלני	176	
Clica	at/Project:								4	•
SIII	MMADV	OF EVCEPT	ION (shorts					-		
]		OF EXCEPT						·		
-		cription of excertion of excertion of excertion of excerting the critical control of the critical cont			omments	(write number of exce	ption descr	ription and the	imp: "ad sample m	
	project.	•	ed by the	aLC11	74-22	TPH couto			benked.	
	2. No chai	in-of-custody provi	ided.							
	1. Chain-	of-custody provide	d bus	סיםו	<u> 74-06</u>	+ ordalla	-07	1 64 6	EDG CO	Renjes2
	incomp		1	Rincend	ED BR	ok e j				,
J	4. Sample	s broken or leakin	g on receipt.						())	
-	5 Temper	rature of samples i	nanocooriata	تصل	174- 14	1 44 9	couto	were to	r 610 m	ONGE
	for ana	lysis requested.	mapping in	REEN	ma he	oken:				
	6. Contair	ner inappropriate (or analysis							
	request		o Con on alumin	0.0.	1174-	3 TAN U	<u>धावर्यं</u>	er Rec	<u>L</u> broked	· .
	request	uate sample volum ted.	e for amalysis							:
		ration inappropriat	e for analysis							
	9. Sample	ed. s received out of l	olding time					·		
	for ana	lysis requested.				•				
		es received more the ampling.	nan 72 hours				:			
		pancies between c	hain-of-							
		y and container lat			•					
	12. Other	(describe on right))			. <u></u>			•·	(v.)
FR	ACTION	(S) AFFECT	ED (specify which	& fraction	n affariad bu	the exceptions detaile	d abana ba			
Uı	preserved		Nutrien	(s	s allected by	Metals	3 200VE 07	WALLES BY	Volatiles	on next to it)
	Cyanide		Extractable	_		Extractables				
			LANGUAGOR		$\underline{}$	EXTRICTADICS			Other (specify)	लंदारा वध
AC	TION TA	KEN:							•	
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	<u> </u>				:				 	
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	ginator:	Same	JI.D			Supervisor:				•
Cli	ent was noti	fied on: 7/24	96 /7	79X	Client	contact: Sc	44	DOYEL	ik / per	
	ent's comm		10 1.7	<u> </u>	•		~	00.00	-14 11000	
		·. ——					<u>.</u>			
	* *					·	-·		·	
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:		·							· .	
Cli	ent Services	:				QA officer:				
•										

000159

Date: 01-AUG-96 Time: 01:46 pm

To: LRD

Date Due: 14-AUG-96 (Wednesday)

Batch: MB444

QA Level: 1 Batch Comments: None

Test Description		Reporting List ID	Method	Quick Turn Aro Req Days Date	und			
Sample: MB444001 RB Collected: 23-JUL-96 12:00 am	Matrix: Water	Sample Comments: None Client Sample ID: OLD7174R2	Client Sample	Description: RB-2			•	
602(MOD)-AROMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW		ARE HCE	EPA602(MOD) EPA601(MOD)	, N				
Sample: MB444002 FS ollected: 23-JUL-96 10:30 am	Matrix: Water	Sample Comments: None Client Sample ID: OLD717409	Client Sample	Description: MW-9				
602(MOD)-AROMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW		ARE HCE	EPA602(MOD) EPA601(MOD)	N N				
Sample: MB444003 FS Dilected: 23-JUL-96 10:30 am	Matrix: Water	Sample Comments: None Client Sample ID: OLD71749D	Client Sample	Description: MW-9D				
602(MOD)-AROMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW		ARE HCE	EPA602(MOD) EPA601(MOD)	N N				
Sample: MB444004 FS Illected: 23-JUL-96 10:00 am	Matrix: Water	Sample Comments: None Client Sample ID: OLD717417	Client Sample 1	Description: MW-17				
602(MOD)-AROMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW		ARE HCE	EPA602(MOD) EPA601(MOD)	N N				
Sample: MB444005 FS Ollected: 23-JUL-96 11:00 am	Matrix: Water	Sample Comments: None Client Sample ID: OLD717418	Client Sample D	Description: MW-18				
602(MOD)-AROMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW		ARE HCE	EPA602(MOD) EPA601(MOD)	N ·				
Sample: MB444006 FS liected: 23-JUL-96 01:05 pm	Matrix: Water	Sample Comments: None Client Sample ID: OLD717419	Client Sample D	Description: MW-19	0,	L / REDOI:	IO PERE	TOT
602(MOD)-AROMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW		ARE HCE	EPA602(MOD) EPA601(MOD)	N N	QC LEVEL		ICE	 Y
Sample: MB444007 FS llected: 23-JUL-96 12:35 pm	Matrix: Water	Sample Comments: None Client Sample ID: OLD717420	Client Sample D	Description: MW-20	COC	Y	TEISP	3℃
602(MOD)-AROMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW	A The second	ARE HCE	EPA602(MOD) EPA601(MOD)	N N	CUST SEAL	Y	FH	
Sample: MB444008 FS FS 11 FS	Matrix: Water	Sample Comments: None Client Sample ID: OLD717421	Client Sample D	Description: MW-21	HHS UPS	(LED-EX)	OTHER	
ey: FS = Field Sample; RB = R	insate Blank; TB = T	rip Blank		•		e .		· · ·
linquished by (Date/Time):		Received by (Date/Time): Annakae	Sulp 8/2/96	Airbill O930 Number:	260 396	6 303		
Send Report to: No 'REPORT' Ac	ddress information w	as found for ACCOUNT: 'SUBCONTRACT LABS'						

Date: 01-AUG-96 Time: 01:46 pm

To: LRD Date Due: 14-AUG-96 (Wednesday)

Batch: MB444 QA Level: 1 Batch Comments: None

Test Description	· , , , , , , , , , , , , , , , , , 	Rep	porting List ID	Method	Quick Turn Around Req Days Date	
602(MOD)-ARCMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW	ı	ARE HCE		EPA602(MOD) EPA601(MOD)	N N	
Sample: MB444009 FS Collected: 23-JUL-96 11:48 a	Matrix: Water m		Sample Comments: None Client Sample ID: OLD717422		Description: MW-22	
602(MOD)-AROMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW		ARE HCE		EPA602(MOD) EPA601(MOD)	N N	
Sample: MB444010 FS ollected: 23-JUL-96 11:25 an	Matrix: Water n		Sample Comments: None Client Sample ID: OLD717423	Client Sample	Description: MW-23	
602(MOD)-AROMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW		ARE HCE		EPA602(MOD) EPA601(MOD)	N N	
Sample: MB444011 TB ollected: 23-JUL-96 12:00 am	Matrix: Water		Sample Comments: None Client Sample ID: TRIP_BLANK		Description: TRIP_BLANK	
602(MOD)-AROMATICS,W/WW		ARE		EPA602(MOD)	M DEANK	
Sample: MB444012 RB pllected: 22-JUL-96 08:01 am	Matrix: Water		Sample Comments: None Client Sample ID: OLD7174R1		Description: RB-1	
602(MOD)-AROMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW		ARE HCE		EPA602(MOD) EPA601(MOD)	N N	
Sample: MB444013 FS llected: 22-JUL-96 10:25 am	Matrix: Water		Sample Comments: None Client Sample ID: OLD717405	Client Sample	Description: MW-5	
602(MOD)-AROMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW		ARE HCE		EPA602(MOD) EPA601(MOD)	N N	
Sample: MB444014 FS llected: 22-JUL-96 10:25 am	Matrix: Water		Sample Comments: None Client Sample ID: OLD71745D	Client Sample D	Description: MW-5D	
602(MOD)-AROMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW		ARE HCE		EPA602(MOD) EPA601(MOD)	N N	
Sample: MB444015 FS lected: 22-JUL-96 11:02 am	Matrix: Water		Sample Comments: 1 OF 2 EDB CO Client Sample ID: OLD717406	ITAINERS REC. BROKEN Client Sample D	escription: MW-6	
602(MOD)-AROMATICS,W/WW 601(MOD)-HALOCARBONS,W/WW		ARE HCE		EPA602(MOD) EPA601(MOD)	N N	
Sample: MB444016 FS	Matrix: Water		Sample Comments: 1 OF 2 EDB COM	TAINERS REC. RROKEN	·	
: FS = Field Sample; RB = Ri	nsate Blank; TB = Ti	rip Blank		DROKEN		
inquished by (Date/Time):			Received by (Date/Time): Skinding	20	Airbill 2603966303	